

# THE AMERICAN FISHING SCHOONER



**MODEL SHIPWAYS**  
• QUALITY KITS SINCE 1946 •

## Technical Characteristics

Scale: 1/4" = 1 ft. ( 1: 48 )

Length: 33"

Width: 5-1/2"

Height: 28"

Manufactured by  
**Model Shipways**



**Kit No. MS2109**

## BENJAMIN W. LATHAM

The northward spring migrations of the American mackerel (*Scomber scombrus*, L.) gave rise to one of the most interesting and speculative facets of the New England fisheries in the second half of the 19th century and the early decades of the 20th. Many methods were developed to capture these wily and unpredictable fish, the most successful being the purse-seine, a large net which was set in a ring around a mackerel school and then closed by "pursing," or drawing its bottom edge together with a "purse line," thus forming a bag from which the trapped fish were baled with large dipnets.

The development of the purse-seine also led to the development of the seine boat, a large double-ended boat from which the net was set. This boat supposedly evolved from the New Bedford whale boat in both form and construction, but was soon modified and enlarged as seine nets became larger. Attendant to this technology was a wide variety of boat and net gear of special design. Because the schooners themselves were specially rigged and fitted for these operations, they assumed a distinctive appearance.

(Continued on page 3)

# Instruction Manual

The American Fishing Schooner  
**Benjamin W. Latham**  
Noank Mackerel Seiner, 1902

By Erik A. R. Ronnberg Jr., 1973

Plank-On-Bulkhead Construction and Overall Manual Update  
By Ben Lankford, 1994

Model built by Bob Bruetsch

The more you read about the New England fisheries, the more fascinating their history becomes. Unfortunately, the few substantial reference works available are mostly out of print, and one must either spend large sums at rare-book shops, or ransack libraries to get at them. The easier volumes to find are those by Church, Chapelle, and Story – all excellent reading. Goode's *The Fisheries and Fishery Industries of the United States* is the great work on fishing methods as practiced in the 19th century. It is now quite rare, but well worth the trouble to locate. Chapelle's book, *The American Fishing Schooner*, is certain to become the standard reference on fishing schooners, their design, and construction. The beginner would do well to consult Campbell's *The Neophyte Shipmodeller's Jackstay* and its excellent references. These and other books are listed in the bibliography at the end of this manual.

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(continued from front cover)

The schooners of the mackerel fleet varied considerably in size at the end of the 19th century. Prior to 1880, vessels suitable for this work usually measured 60-80 tons, but with the introduction of new hull types and incentives to increase the sizes of new schooners, the early 1900's saw schooners of 120 tons, and more, being fitted out for mackerel seining. Auxiliary power was introduced; nets and boats increased in size; double-crews and gear were carried in the largest vessels; finally, in the 1920's, the seine boats themselves were fitted with engines. This last innovation was made necessary by the nets, which had become so large they could not be set and pursed quickly enough under oars alone: if an "average" seine net measured 203 fathoms long by 21 fathoms deep in 1880, by 1910 it had grown to 235 by 23 fathoms, and in the 1920's, when engine-powered boats became common, the seine net measured 300 by 24 fathoms.

The schooner *Benjamin W. Latham* was designed for Captain Henry Langworthy of Noank, Connecticut, by Thomas F. McManus of Boston. She was built in the shipyard of Tarr & James at Essex, Massachusetts, and was launched on October 30, 1902. She was a very small mackerel seiner for her day, measuring only 72 tons gross; the same fishery employed vessels nearly twice her tonnage.

*Latham's* hull is more like the "spoon-bow" type than anything else. At the time of her building, this shape was a relatively new development for fishermen. This design reflects the influence of B. B. Crowninshield who introduced this hull type to the fishing fleet two years previously with his first example schooner, *Rob Roy*. Also unusual was the knuckle at the forward edge of the keel, an experiment which few builders seemed inclined to copy in later vessels. This was a period when owners were anxious to see their vessels fitted with keels that were straight, not "rock-ered," the latter characteristic having caused many schooners to slip and fall down on the marine railways when hauled out. *Latham's* keel may have been over-designed for this reason.

Nearly every vessel in the Noank fishing fleet was fitted for mackerel seining in the early 1900's, and this undoubtedly was the principle activity of *Benjamin W. Latham*. First registered as a sailing vessel, she seems to have been fitted with a 48-horsepower gasoline engine sometime in her second or third season. This would have dictated that her propeller shaft be fitted off-center, either to port or to starboard as shown on the plans. Since a seiner "bailed the seine" (removed the fish from the net) to starboard, it would seem wise to have had the screw to port to avoid fouling the nets.

In keeping with most fishermen, *Latham's* career goes mostly undocumented, except for meager scraps of information yielded reluctantly by officials of customs and registry documents. She is known to have had accommodations for a crew of fifteen, and because of her size, she was a "one-boater" (towed one seine boat). If the seine boat was a 40-footer, it would always have been towed astern, since there was no deck room for it aboard the schooner.

In 1906, *Latham* was re-registered at New York and operated out of the Fulton Fish Market. What sort of fishing she did at this time is not known, although it seems likely that she was converted to dory trawling. Very likely, she would have been cut down in rig in the 1920's, working mainly under power thereafter. What she looked like in 1939 under Puerto Rican ownership is not known, nor is the nature of her work. She was lost in 1943 off San Juan, Puerto Rico.

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## BEFORE YOU BEGIN

This kit differs from most in that its large scale ( $1/4" = 1 \text{ ft.}$ ) will permit the model maker to fabricate or "scratch build" most parts with great accuracy, and in some cases, duplicate full-size construction or techniques in miniature. For this reason, the "hows" and "whys" of the vessel's building and operation will be explained in greater detail than is otherwise customary.

The novice who attempts this kit should accept this challenge to the full limits of his or her abilities. Aspects of construction which may possibly seem too difficult or superfluous to the beginner will be mentioned as such in that particular discussion.

While the modeling progresses, you will see where you may want to substitute some of the kit fittings with your own creations. By all means try them, especially if you think you can improve the model. The worst that can happen is a little lost time. But, the experience gained will be most valuable for future projects. For further reading on modeling techniques refer to the Bibliography at the back of this manual.

Please note that while all of the necessary materials for a beautiful model have been provided, some detailing work has been left to the imagination of the individual modeler. For instance, fishing nets can be made from darkened or stained cheesecloth; knives and hatches from scrap wood and metal; fish cleaning trays from scrapwood; and so on. Also, the kit will contain the minimal number of rigging and block sizes needed for completing the model. You may want to buy other rigging line or scratch build blocks to make the model as close to scale as possible. The detailing possibilities are endless and to provide for all of them with individual parts would result in a kit far too pricey for most modelers.

Assuming a modeler works with reasonable skills about 20 hours per week as a hobby, the *Benjamin W. Latham* model should take about 5 months to complete (roughly 400 hours). The most time-consuming tasks will be planking the hull and completing the masts and rigging. Of course, the time will be extended if any scratch-built items are substituted. But, don't let time govern your progress. The best approach for the beginner, and experienced modeler alike, is to tackle the job as a series of small projects which are conveniently laid out for you in stages. So, don't look too far ahead, or you may become discouraged. Assume each small project is an end unto itself and work on it until it is correct. You will ultimately do a better job on that particular part, and the overall completed model will approach perfection.

Beginners, no doubt, will have some problems, especially if this is the first modeling attempt. The important thing, however, is to learn from making mistakes. Seek help from more experienced modelers or the excellent reference material that is available to you. And regardless of how the model is turning out, finish it completely. Improvement takes experience; it cannot be gained with half-completed models. It would be advisable to follow the instructions in sequence until you gain the experience to work up your own procedures. Have fun with the project and think about how nice it will look on display when it is completed. Good Luck!

## HOW TO WORK WITH THE PLANS AND PARTS

Before starting model construction, examine the kit and study the plans carefully. Familiarizing yourself with the kit will serve two purposes. First, it will let you determine that all parts have been supplied as listed. And second, you'll be surprised at just how quickly handling the parts allows you to better understand the kit requirements. Try to visualize how every part will look on the completed model. Also, determine ahead of time what must be done first. The instructions will help you in this regard, but a thorough knowledge of the plans at the outset is essential.

It is suggested that small fittings and hardware be sorted into labeled containers to avoid loss during building.

### 1. The Plans

The *Latham* model kit contains the following 1972-73 plans:

- 1) Hull & Lines – Plan Sheet 1 of 4
- 2) Rigging – Plan Sheet 2 of 4
- 3) Hull, Mast & Fitting Details – Plan Sheet 3 of 4
- 4) Seine Boat & Purse Seine (rev. 1981) – Plan Sheet 4 of 4

... and the following 1993 plans:

- 5) Plank-on-Bulkhead Hull Construction – Sheet 1 of 2
- 6) Plank-on-Bulkhead Hull Construction – Sheet 2 of 2

Many sketches throughout this manual further illustrate the various stages of construction.

The *Benjamin W. Latham* kit is manufactured to a scale of  $1/4'' = 1$  ft. Each plan sheet is drawn to the exact scale that the model is to be built, except for the rigging plan and some details which have been enlarged for clarity. Therefore, most dimensions can be lifted directly off the plans by using a set of draftsman dividers or by using a "tick" strip, which is simply a piece of paper used to "pick up" the dimensions (a roll of calculator tape works very well). Lay your paper strip down on the plan and carefully mark each dimension to be transferred with a sharp pencil. Then "lift" these measurements by placing the strip down on the wood or item to be made to scale and transferring them. You should also obtain a  $1/4$ -inch-to-the-foot architect's scale, since all dimensions on the plans are full ship sizes.

An outline that lists rigging and block diameters for the *Latham* is on page 34, along with a Diameter Conversion Table for converting the full ship rigging and block sizes to  $1/4$ -inch scale. The table provides a formula for converting diameters to  $1/4''$  scale. Several conversions have already been calculated for standard diameters.

Try to maintain the scale size when modeling. As scales get smaller, the tendency is to build on the heavy side, possibly from concern about breaking small parts. Models look best, however, if built to exact scale and even to thinner-than-scale, which should be the case for a rigging line if the exact size is unavailable.

### 2. Making Allowances Along the Way

Try to be exact when following the plans, but use common sense along the way. You may need to make adjustments or allow for small differences in how your model is shaping up: perhaps your mast has too much rake (the angle at which it sits). When lines go to belaying points they should not drape over parts or conflict with other lines. If necessary, move a belaying point or a fairlead block. In other words, put yourself on the schooner and use your judgement. That is how the early ship riggers worked!

### 3. Understanding the Hull Lines

Beginners may not be familiar with hull lines. They are shown on the Hull & Lines plan 1 of 4. The buttock lines (they are the vertical lines on the body plan and shown as curved lines on the profile view) are simply vertical longitudinal sections taken through the hull. The waterlines, or half-breadths, are horizontal planes, and the section lines numbered 1 to 22 are vertical transverse sections. All of these lines define the hull shape and are used by the draftsman to fair (create regular even curves) the hull form. With the plank-on-bulkhead construction, the laser cut bulkheads define the hull form. These are based on the hull lines, but are made smaller to allow for the thickness created by adding the planks.

### 4. Cast-Metal Fittings

The *Benjamin W. Latham* kit is supplied with Britannia metal, brass, as well as wooden fittings to eliminate problems in making such parts from scratch. The Britannia metals are a great improvement over the white metal that was used in some older kits. Unlike pewter, Britannia does not contain lead, so there are no possible corrosion problems. Many of these fittings, however, will require final finishing before they are suitable for installing on the model.

Before painting the cast-metal fittings, clean them up by removing all the mold-joint flash. To do this, use a No. 11 hobby blade to cut the flash, then sand with fine sandpaper. It is also suggested that you clean the fittings thoroughly with warm soapy water before applying primer. Make sure they are rinsed thoroughly and allowed to dry before painting.

### 5. Soldering & Working with Brass

Some fittings for the *Latham* model, such as mast bands, must be made from brass (see figure 1a). Therefore, a certain amount of metal working and soldering will be required. Brass strips are included in the kit. The brass sheet can be cut with a small pair of tin snips or heavy scissors. Heavier brass will require the use of a jeweler's saw. After cutting, all edges should be smoothed with needle files and fine wet-or-dry sandpaper. When cutting slivers from the brass sheet, you may notice that shears tend to bend the sheet sideways, as well as curl the piece. To straighten the edges in both directions, grip with a pair of small pliers.

Drilling holes in brass can be accomplished using small drills and a pin vise, which is a slow process. A Dremel Moto-Tool mounted on a Dremel drill press is ideal. This tool is worth the cost. Prior to drilling, use a small centerpunch to start; otherwise, these small drills tend to wander. Lubricate with a light oil and drill very slowly to avoid breakage. When using the Dremel, clamp the pieces in place or hold them down with a stick of wood. The brass will be very hot, so keep your fingers off!

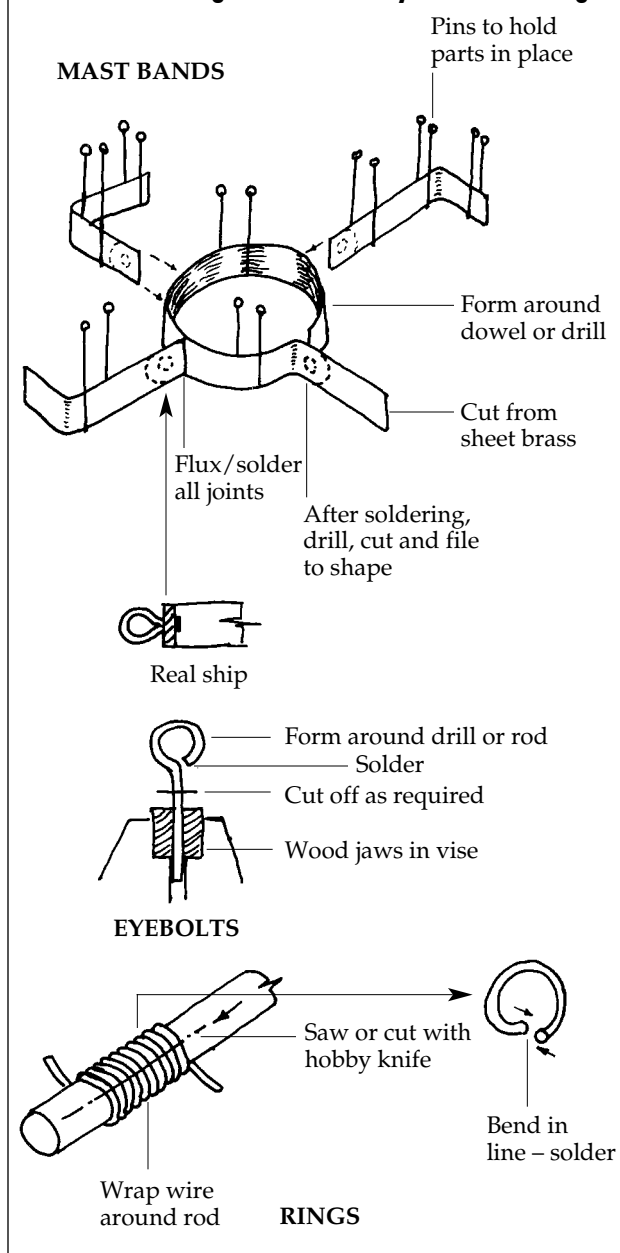
**Soft Soldering:** The key here is to keep all brass parts clean. Use a solvent, or lightly sand, or both. Keep your fingers off to avoid grease spots. Soldering is easy if care is taken to properly set up your work area first. Use jigs or other holding devices, so the parts do not move around. Soldering can be done with a small torch or pencil soldering iron. First, add flux to the joint, just enough to do the job. The solder will flow where the flux is applied. Next, heat the joint.

This sequence is important. The larger the parts, the longer it will take to heat the brass before the solder will flow. If you get too much solder on the joint, file it off with needle files. You'll want the joint to look like the real thing, not a big glob of fillets.

**Silver Solder:** If extra strength is desired, and also to avoid the lead in softer solder, silver solder can be used. A propane torch is a must, as the melting point of silver solder is much higher. Clean the metal and apply the flux (liquid silver solder flux is better than the borax type). Cut a very small piece of solder and lay it next to the joint. This is necessary because, unlike soft solder, silver solder will not break away from the roll. It tends to ball up on the end. Next, heat the joint and solder it together. When the correct temperature is reached the solder will jump into the joint—job completed! Be careful to remove the heat as soon as possible, because the brass also will be near its melting point.

Figure 1a illustrates how to make mast bands, eyebolts and rings. Rings can be soldered after they are used on the model, or not soldered at all, unless there is some strain on the ring from rigging.

**FIG. 1a - Making Mast Bands, Eyebolts and Rings**



## WHAT YOU'LL NEED TO START CONSTRUCTION

The following tools and supplies are recommended for the construction process. Modelers who have built before may have their own favorites.

### A. Knives & Saws

1. Hobby knife with No. 11 blades
2. Coping saw (or jeweler's saw frame) and fine blades
3. Razor saw

### B. Files – Set of needle files

### C. Carving Tools – Small chisel for carving center keel rabbet

### D. Sharpening Stone – Necessary to keep the tools razor sharp

### E. Clamps

1. A few small C-clamps
2. Several wooden clothespins
3. Rubber bands

### F. Wire Cutters & Tin Snips

For cutting fine wire & chain; for cutting brass sheet

### G. Boring Tools

1. Set of miniature drills: #60 to #80
2. A pin vise
3. Larger bits: 1/16", 3/32", and 1/8"

### H. Miscellaneous

1. Tack hammer
2. Tweezers (a few)
3. Small fine pointed scissors
4. Miniature pliers
  - a. small round for forming rings and eyes
  - b. flat nose (with serrated jaws)
5. Draftsman's dividers
6. Proportional dividers
7. Bench vise (small) with own base for moving around
8. Soldering iron with 1/8" diameter tip and/or propane torch
  - a. solder
  - b. flux
9. Sewing thread (for seizings & lanyards; other rigging in kit)
  - a. black
  - b. beige
10. Beeswax (for treating rigging lines)
11. 1/2" or 3/4" masking tape

### I. Sandpaper – Fine and medium grit garnet or aluminum oxide sandpaper (#100 to #220 grit)

### J. Finishing: – Paint brushes

1. Fine point for details
2. 1/4" to 1/2" flat square for hull

### K. Supplies: – (will be covered in detail in the Painting & Staining section and throughout instructions.)

1. Paints
2. Primer
3. Stains/varnish
4. White or Carpenter's (yellow) wood glue
5. Five-minute epoxy
6. Super glue

### L. Cotton or linen cloth: (fine weave) for sails, if added

### M. Plastic: Plastic sheet or glass for windows, skylights

**Note about Glues:** White or Carpenter's yellow wood glue will suffice for most of the model. Five-minute epoxy provides extra strength for gluing fittings. Cyanoacrylate (Super) glue such as Jet, can be used for quick adhesion and is ideal for dabbing onto a rigging seizing to hold it in place. The best cyanoacrylate glue for most applications is a medium viscosity gap-filling type. The watery-thin type is recommended to fill a narrow crack by capillary action and for quick setting of hull planking.

## PAINTING & STAINING THE MODEL

It may seem strange to begin an instruction manual with directions on applying the finishes to the model. Not so! Much time and effort can be saved, and a more professional result can be obtained, if the finishing process is carried out during construction. Painting of various small parts, masts and spars should be accomplished before they are installed on the model. Painting sequence must be a well thought out procedure, otherwise you may have difficulty as you proceed with assembly. For example, it is easier to paint a deckhouse or hatch coaming before it is glued to the deck. Put the parts aside until they are ready to be installed. Proper timing in application of finishes and the use of masking tape to define painted edges should eliminate unsightly glue marks and splotchy stained surfaces. In the end, following these general suggestions will be to your advantage.

### 1. Preliminaries

Rub down all external surfaces with 220-grit dry sandpaper and wipe off all dust thoroughly. Give all unprimed surfaces two coats of primer and already-primed surfaces one more coat. A very light sanding is recommended after the last coat of primer, but don't sand down to bare wood, or the water will raise the grain and make a terrible mess. With clean hands, a soft brush, and a clean, soft rag or tack rag, gently dust and wipe off the hull.

Choosing paint: Consider carefully the kind of paint you will use to paint your model and the methods of application that suit you best. Is the paint that you have chosen compatible with the primer previously applied, or does it blister, crinkle, or turn to "alligator hide?" Better find out! Prime a test block of wood with the same primers used on the model. When dry, apply a coat of the brand of paint you have chosen. If the two don't "fight" as described above, you may consider it safe to proceed.

For hand brushing, use a flat-finish paint. Glossy finishes are not desirable. A satin finish will give the most satisfactory results, but the undercoat paint should be dead flat. Use model paints such as the Historic Marine Colors made by Model Shipways and sold at the Model Expo website: [www.model-expo-online.com](http://www.model-expo-online.com).

Are you ready for a real top quality paint job? Although slightly expensive, an airbrush is well worth the investment. Model Expo sells a very affordable airbrush at [www.model-expo-online.com](http://www.model-expo-online.com). Airbrushes are easy to use, work well with all the paints mentioned, and do an exceptional job. The air brush throws a pattern only about 1/2" wide, but obviously, you would still need a large work space such as a house workshop or isolated room.

Whether you prefer to paint by brush or airbrush, try Model Shipways paints. These paints are a very fine and versatile line of ready-mixed water based colors. The colors were specially developed to emulate the paints used by historic ships. They are subdued in tones and their properties make both spraying and brushing techniques easy to master.

Masking off surfaces: It can be very tricky to mask off the surfaces you don't want to paint. Some brands of masking tape are absolutely no good because they allow paint to bleed under them, so be selective. For masking off fine stripes or lines, such as the cove line, it is best to use drafting tape, such as the Chart Pak brand. It is available in widths as fine as 1/32" and 1/64." This tape has very good adhesion and will not bleed when applied firmly. You may also use black plastic electrician's tape. Spray Painting: Spraying techniques work best with fast-drying lacquers. You will find many brands of paint available in

aerosol cans which can give quite good results. Test them on a wood block as previously described before using them on the model.

Brush painting: Painting with fine, soft-bristle brushes is probably best for the beginner. And many highly skilled model-makers prefer the brushed-on technique because a brushed surface, with its fine imperfections, imparts a more life-like appearance to the model.

Choosing Brushes: Brushes must be very soft and of the highest quality. Artist grade sable or synthetics are the best. They should be a littler wider for painting the surface. A too narrow brush will cause excessive streaking of the finish.

Brushing Technique: When applying paint or stain with a brush, lay down one thin coat in a single stroke, then coat the adjacent areas with single strokes. Never make strokes over fresh paint, or you will tear up the surface. Let the paint dry to a hard finish before applying a second coat.

Scribing the Waterline: One method of scribing is to level the hull (mount it so the waterline is parallel to the bench top) and mark the waterline using a height gauge and a sharp scriber point (see figure 1b). It is then a matter of painting the bottom and topside colors precisely to this mark, with or without the aid of masking tape. The scribe line acts somewhat as a barrier to paint transgressions, but a steady hand is needed for this operation.

A second method is to spray or brush on the bottom color, guessing roughly where the waterline will lie and deliberately painting beyond this arbitrary boundary. The waterline is then scribed on this overlapping coat of bottom paint and the topside coat is painted down to the line, covering previous excesses. Masking tape can be used as a substitute for shaky hands when painting to the line.

### 2. Color Scheme

By the early 1900's, the era had long passed when a fishing schooner, to quote Chapelle, was "dolloed up like the little blue wagon." Then, black hulls, grey decks and white superstructures were the most common color scheme. There were a few variations, however, and always the chance for a little "gold leaf and tinsel."

Hull: The bottom of a schooner very likely had a coat or two of Tarr & Wonson's copper paint, then a deep reddish brown. The topsides were black (add a drop or two of red or umber to soften intensity) with gilt scrollwork and cove moldings (these were sometimes yellow, depending on the budget).

It may be wise to paint the cove molding prior to painting the topsides black. Whether yellow or gold suits your fancy, brush the paint into the molding (or where the molding should be, if you omitted it) and allow it to dry thoroughly. Mask over the cove with 1/32" drafting tape (1/64" is more to scale but tricky to handle) and press it down gently, using a piece of metal rod or some similar burnishing tool. Paint over the topsides with black and remove the tape gently as soon afterward as possible, peeling at an acute angle to the surface.

Tops & Inboard Sides of Main & Monkey Rails: paint white; outboard edges should be black.

Bulwarks (Inboard): paint white from rails to decking.

Structures ranging from Bitts to Trunk Cabin: usually painted all same color: white (or any color that suits you, as captain of your ship)

Hatch Covers: color of the deck.



Grub (or Great) Beam: often painted white for visibility at night.

Deck: could be light grey, although some vessels' decks were painted Pea Green. Sometimes great circles were swept around the quarter bitts, at the grub beam, and abreast the foremast. The color used for the deck was then painted within the radii (see perspectives drawings on sheet 3 or 4—these are the dark areas shown on the deck around fiterails, windlass, and along the waterways).

Waterways: Outside the previously mentioned circles, the waterway color was painted (this could be white to match the bulwarks, or a deep prussian blue, which was then quite popular). In painting the waterways, the caulking line between it and the deck plank was rigidly followed, even where planks were nibbed, giving a sawtooth effect along some stretches. Beyond the arcs of the circles, this did not matter.

Ironwork: was generally black, but sometimes a benign soul would paint the hawse pipe linings and lips a bright red. The diaphragm pumps were similarly treated; sometimes they were a bright red all over; other times they would be black with only the insides of the bowls and spouts painted red.

Anchors: may be painted black or left a red-lead color, but their stocks were tarred a glossy dark brown when the tar was fresh. The anchor chain sat in a rusty heap in the chain box and may be "antiqued" accordingly on the model.

Windlass Barrel: often had its ironwork blacked. The barrel inside the riding bitts was oiled or black-varnished, making it very dark and somewhat glossy. The windlass heads, however, were often painted white, ironwork and all. In later years, many windlass barrels were completely painted, usually white.

Hub, Rim & Spokes of Stoddart Steering Wheel: could be painted grey or white, the mahogany spokes would have been oiled and their brass caps polished bright.

Bowsprit: may be black or white inboard, and black outboard, with the iron bands black and the pole white. All gaffs and booms should be salmon-buff with white tips.

Masts: The lower masts were painted white from the deck to the boom saddle or the gooseneck; the mastheads were often white, but some vessels, including *Latham*, had buff mastheads with black ironwork. The tips of the mastheads, which protruded above the caps, were often white-leaded. The topmasts at the doublings were the color of the lower mast heads; their poles were generally white. All blocks, regardless of location, would have been painted the same color as the spars: white or buff.

The hoists of both lower masts and topmasts, over which the gaffs and mast hoops traveled, were "slushed" or coated with a mixture of tallow and grease. This allowed gaffs and hoops to slide up and down with a minimum of friction. The color was a greyish-umber which darkened when its greasy substance caught dirt and grime.

Seine Boat: was usually painted white with copper anti-fouling paint below the waterline. Its inboard works should be all grey or white.

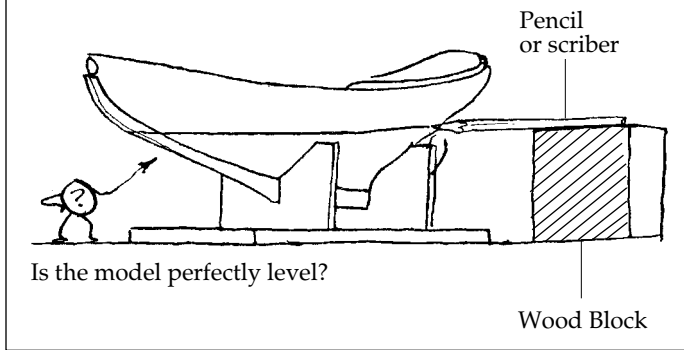
Gunwales & Gunwale Strakes: were generally a bright yellow, set off by a red stripe along the lower side.

Dory: any shade of buff, grey or green with light grey inboard.

Oars: oiled natural, but inevitably turned a weathered grey.

Lanterns: Port lantern board is red and the starboard is green.

**FIG. 1b – Scribing the Waterline**



## STAGE A

### FRAMING THE PLANK-ON-BULKHEAD HULL

#### 1. Bending Wood

Building a P-O-B hull requires some wood bending and twisting of the wood parts which must remain in the desired position so as not to put too much stress on glue joints and fasteners. Following are three different methods of bending and shaping wood:

**Steam Bending:** This is done by holding the wood piece that you want to bend over a kettle of steaming water and then bending it. The wood must be held in the bent position until it cools. It should remain nearly in that position, but may spring back slightly.

**Soaking:** Another method is to soak the wood piece in warm water for several hours. Try adding a little household ammonia to the water. This speeds up the soaking process and makes the wood fibers slippery so the wood is easily bent. After soaking the wood, shape it to the desired position, using a form. Let it remain there until it has dried completely.

**Hot Iron Bending:** You may also bend wood quickly over a soldering iron, but don't let it get too hot. It is also possible to purchase model plank bending irons commercially.

#### 2. Center Keel Assembly

The first step in constructing the hull is to assemble the four halves of the laser-cut center keel pieces. First, use a sharp pencil and mark the bulkhead locations below the slots and the WL-6 reference line. Mark on both sides of each center keel piece. Be especially critical in locating the reference line. Measure from several points, taking them from the plans. This reference line is a key to proper alignment. Next, glue the two 1/8" laser cut parts that make up keel piece No. 1 together with white glue and place a weight on the unit until it dries. Make sure that the pieces are accurately aligned. Repeat the process with the two 1/8" pieces that make up keel piece No. 2.

Place the two parts, 1 and 2, over a sheet of wax paper or plastic wrap, on a flat building board or table. Glue the joint with white or carpenter's wood glue. Use a steel or aluminum straight edge to align the WL-6 reference line. Place a weight on each piece to hold it down while the glue dries. Let the glue dry at least overnight, preferably 24 hours (see figure 1c).

Next, cut the rabbet in the center keel. The bearding line is the intersection of the center keel and the inside face of the hull planks. After the center keel is ready, mark the bearding line on both sides. The bearding line appears along the sternpost and the keel-stem. Measure from the P-O-B plans. The plans show a real ship rabbet for the planks and a model option that is easier to do. Using a chisel, start the rabbet cut at the bearding line and cut toward the edge of the center keel. When the planking is installed, the planks will lie flush on the cut portion from the bearding line to the rabbet (see figure 2). This completes the center keel preparation.

#### 3. Installing the Keel-Stem, & Sternpost

The fishing schooner has no real point of change between the keel and stem, so we will call it a keel-stem. The laser-cut keel-stem (four pieces: glue together as was the Center Keel Assembly) and sternpost can be added now. Taper the keel-stem according to hull detail plans before gluing it in place. Dowels can be used to help align and hold the pieces. Remove any glue squeeze-out from the rabbet before it sets (see figure 3).

FIG. 1c – Assembling the Two Center Keel Pieces

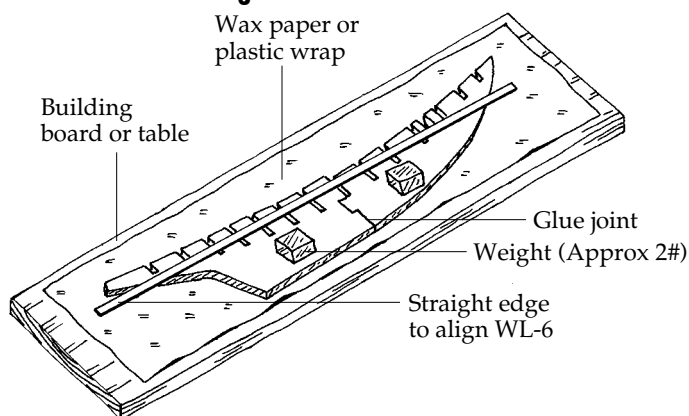


FIG. 2 – Cutting the Rabbet in the Center Keel

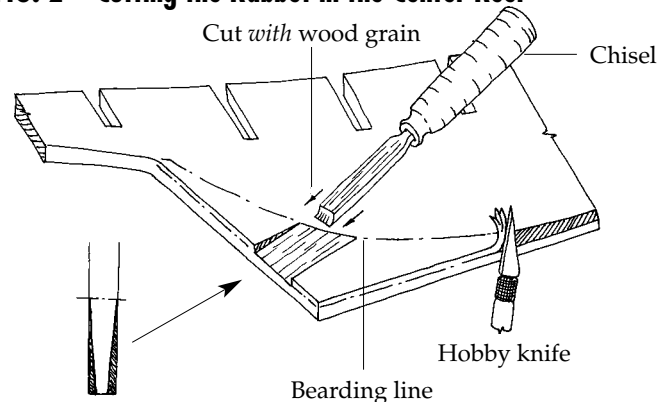


FIG. 3 – Installing the Keel-Stem & Sternpost

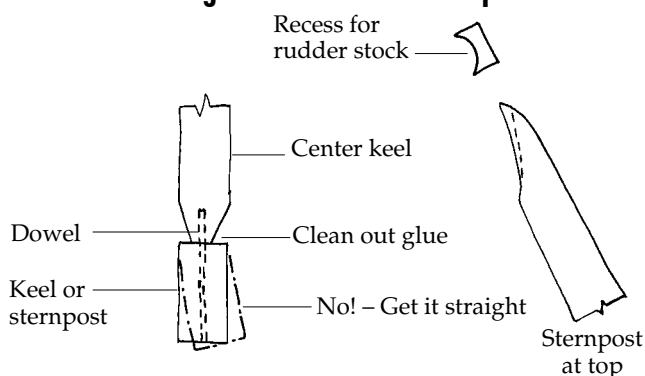
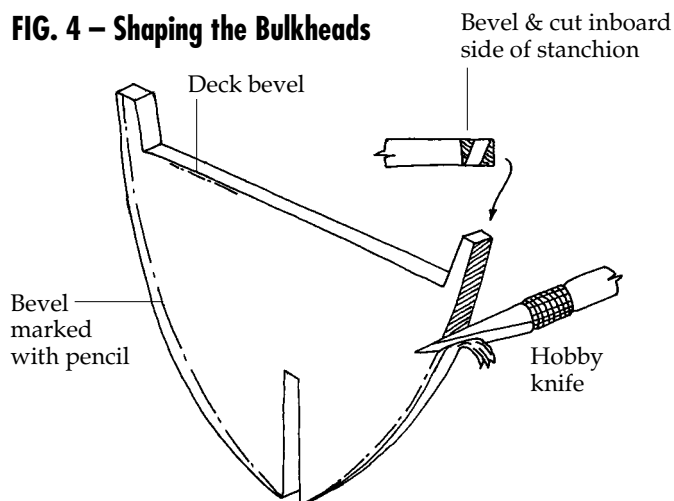


FIG. 4 – Shaping the Bulkheads



The top of the sternpost requires a slight recess where the rudder stock will be located. Carve this in before installing the sternpost (also see figure 3).

**Option:** You can add the keel-stem and sternpost before cutting the rabbet. It makes the rabbet a little more difficult to cut, but allows an easier installation of the keel-stem because there is more gluing surface.

## 4. Installing the Bulkheads

The bulkheads are labeled "A" through "N". Compare the laser-cut bulkheads with the plans to determine which is which and label each bulkhead. Check each bulkhead to make sure it will slide into the center keel slots. Machine tolerances during laser cutting may provide a too tight fit. Sand the slots, if necessary, until the bulkheads slip on. The fit should be snug, allowing a little tolerance for glue.

On each bulkhead, mark the location of the WL-6 reference line in pencil. This mark should line up with the WL-6 mark on the center keel. This alignment will assure that the hull form is accurate and that each bulkhead is in correct relationship to the others.

Next, mark the bevels on the bulkheads. Use a tick strip to transfer the bevel line as shown on the plans, or cut the bulkhead patterns from the plan and glue them onto the bulkheads. You may also lay the pattern over the bulkhead and use a pin prick to locate the bevel. Cut the bevels with a #11 hobby knife blade (see figure 4).

Some of the bevels are very slight, especially the deck bevels and the side bevels near amidships. These can be sanded after the bulkheads are installed, instead of pre-cutting them.

All of the laser-cut bulkheads extend up to the underside of the main rail to include a timberhead (bulwark stanchion). Consequently, bevels must be cut on the inside of the stanchions as well as on the outside. The bulkheads are located at every third stanchion. Two additional "fake" stanchions will be added between the bulkheads after the hull is planked.

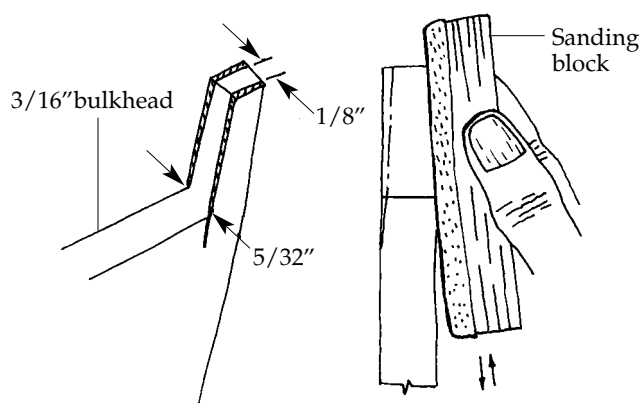
In addition to the side bevels, the bulwark stanchion portion of each bulkhead must be shaped on the fore and aft side. This can be done with a sanding block (see figure 5). The stanchions taper slightly and are about 1/8" wide at the rail and 5/32" at the deck.

Glue the bulkheads in place, making sure that the WL-6 marks on the bulkheads and the center keel line up. Use a square to make each bulkhead perpendicular to the center keel. Then tack a temporary strip to the top of each bulkhead to hold it in place while the glue dries (see figure 6).

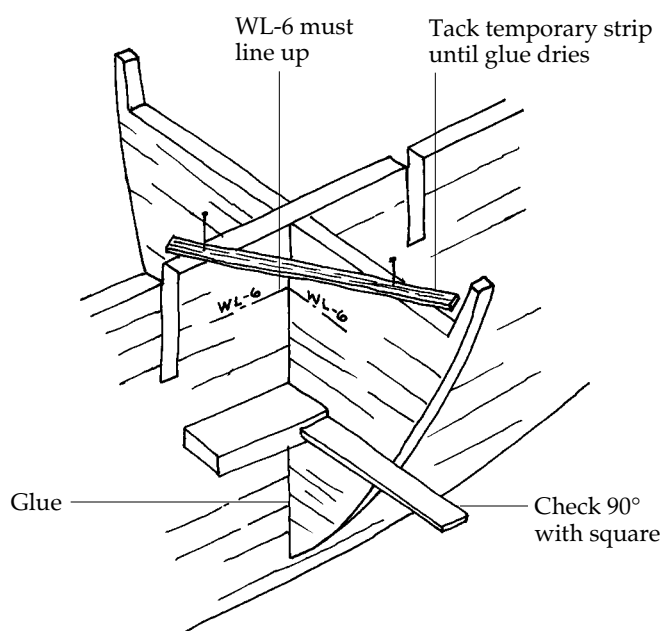
After all bulkheads are in place, tack a temporary batten on each side of the hull just below the deck (see figure 7). This is a critical step. Measure the spacing between bulkheads and re-tack the battens until the hull is aligned. Even though the center keel was assembled flat, it could warp out of line. The end result would be a banana-shaped hull. Check the spacings between bulkheads, and port against starboard spacings. Check the hull visually to see if it is properly aligned.

When you are satisfied that the hull is aligned, make sure the bottom of each bulkhead feathers out and lays precisely on the bearding line. Trim as necessary to line up. Also, check to see that the top of each bulkhead at the centerline is flush or slightly higher than the center keel. Since all alignment is based on the WL-6 marks, there could be some slight errors. If the center keel is below the top of the bulkheads, that's OK. If above, trim the center keel until it is flush with the bulkheads.

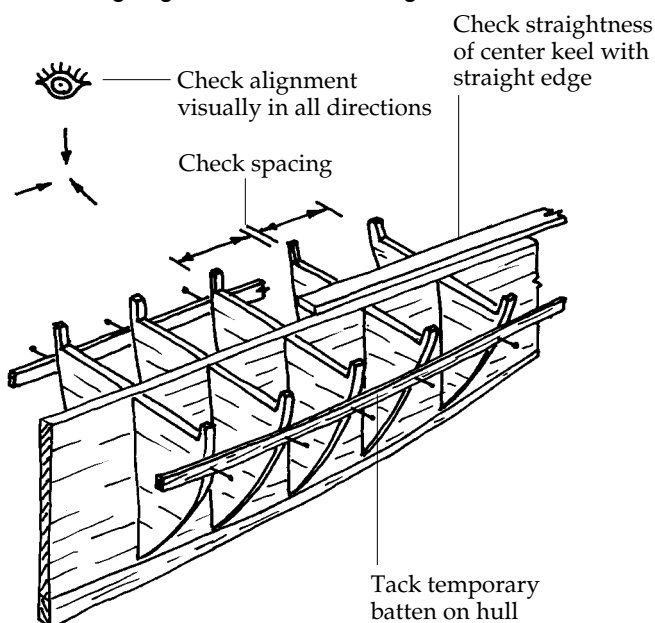
**FIG. 5 – Fore & Aft Bevel of Stanchions**



**FIG. 6 – Installing the Bulkheads**



**FIG. 7 – Aligning the Bulkheads, using Battens**



Next, check the fairness of the hull form and sand in the slight bevels that were not pre-cut. To do this, use a stiff basswood batten about 3/32" thick and lay it across the bulkhead edges and deck in various locations (see figure 8). If not fair, sand the bevels that stick out, or add shim material if there are dips. This is an important check. When you start planking, the planks should lie flat against the bulkheads. No bumps or dips should occur on the surface. Be mindful here—the functioning of Murphy's rule is a possibility. And, manufacturing or assembly errors can occasionally creep in.

Notice that from the intersection of the sternpost to the transom, there is no bearding line. This portion of the center keel is a horn timber on the real ship. The planking will butt against the timber, so no rabbet cut is necessary. More on this later.

## 5. Installing the Transom

The stern of most ships is difficult to visualize and to construct. The *Benjamin W. Latham* has a transom that slopes sharply aft. A laser-cut transom piece is provided in the kit. This piece represents the framing timbers of a real ship. It will be covered with 1/16" planks on the outside and 1/32" planks on the inside. But for now, it is important to install only the laser-cut piece.

There are various bevels that must be cut on the transom piece (see the plans and figure 9). The bevels, where the planking will join, are especially critical. The top bevel will receive the main rail. The lower (side) bevel receives the hull planking and is a little tricky to cut. But, if you don't get it exactly right, it can be corrected during the planking operation to assure that the planks land flush on the bevel. After the bevels are cut, steam bend the transom piece to the required curve (see plans and figure 10).

Next, slip the transom slot over the center keel in the position shown on the plans. Make sure the angle is correct by using scrap wood to create a template for the angle. Glue the transom to the center keel. Tack a temporary batten on each side from bulkhead "N" to the transom to hold it in place (see figure 11).

Visually check the transom for alignment, sighting fore and aft, and from the side. Get it right; a twisted transom looks bad and creates a problem during the planking process.

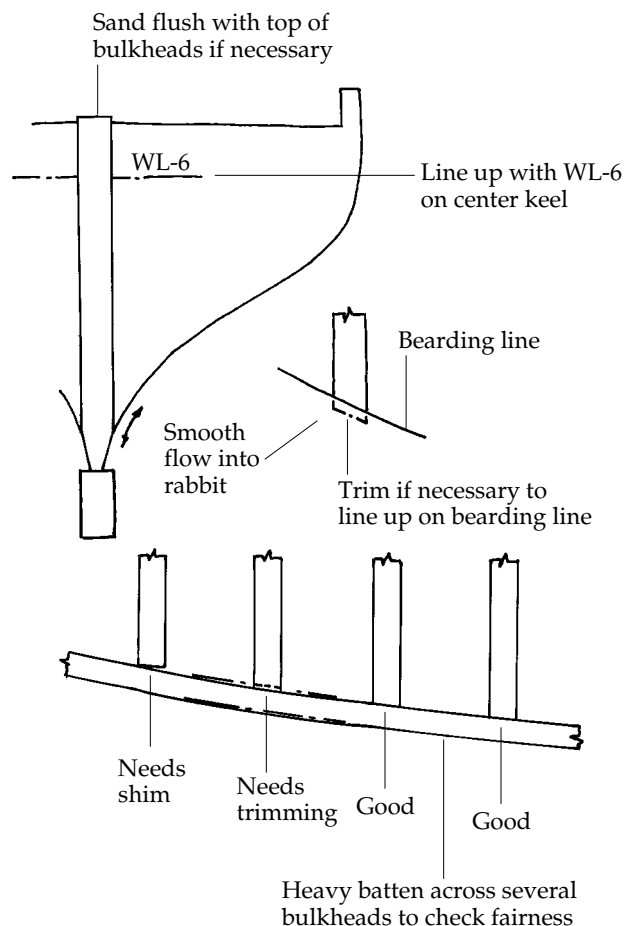
## 6. Covering the Mast Slots

On both sides of the mast slots in the center keel, add the pieces shown on the P-O-B plan. Cut them from scrap wood. Glue them securely, because you won't be able to get to them after the decking is installed. The mast slots should be slightly larger than the actual mast. The masts will be wedged in their holes when installed.

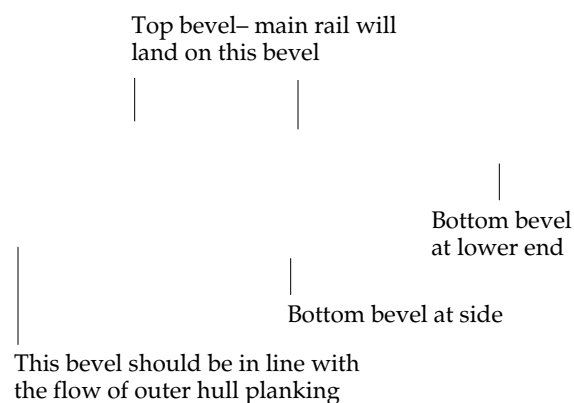
## 7. Drilling the Rudder Stock Hole

Drill or carve a hole into the center keel directly above the sternpost as shown on the plans. This hole will receive the rudder stock. You could omit the hole, cut the stock flush with the hull, and simply glue the stock to the hull, but the effect is nicer if a hole is present.

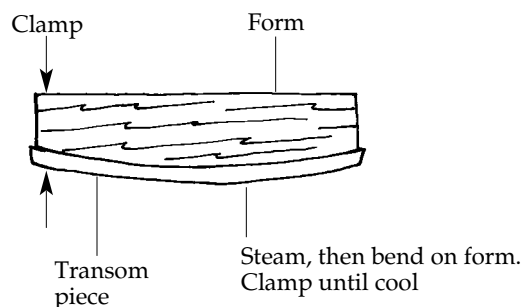
**FIG. 8 – Checking the Fairness of the Hull Form**



**FIG. 9 – Cutting Bevels on the Transom**



**FIG. 10 – Steam Bending the Transom Piece**



## 8. Installing Horn Timber Cheeks

From just forward of the hull/sternpost intersection to the transom, fit a 1/8"-square piece between each bulkhead on both sides. These "cheek" pieces are located slightly more than 1/16" up from the bottom of the center keel. This area of the center keel represents a horn timber on a real ship. The cheeks are for attaching the hull planks at the horn timber. On a real ship they are bolted to the horn timber (see figure 12).

Notice in the sketch that the bottom of the horn timber from the sternpost aft is not completely flat, but is a shallow vee shape. After the planking is installed, this vee can be sanded in, or you can cut it before planking.

## 9. Installing the Planksheer

A large ship, such as a clipper, has a separate planksheer, waterway, and nibbing strake for deck planking. On the fishing schooner, one piece serves all three functions. The outboard edge of the planksheer is flush with the outside hull planking, and the top of the plank is flush with the deck planking. Nibs are cut into the inboard edge for the deck planks.

On the larger real vessel, the planksheer (or planksheer-waterway in this case), would be a solid piece with holes cut out for the bulwark stanchions. With holes cut, the planksheer then would be slipped over the stanchions. For the model, each planksheer-waterway section is made up of two pieces. A laser-cut piece has slots for the stanchions on the outer edge at each bulkhead. After this piece is installed, a 1/16"-square strip will be added to the outboard edge to complete the model planksheer.

At this time, there are no nibs cut into the inboard edge of the planksheer. Cut the nibs during the deck planking process in order to avoid errors.

It may be necessary to file the planksheer slots so they fit snugly around the stanchions. Also, the aft end of the quarter deck planksheer is longer than required. Cut the end to fit against the transom. The forward end of the quarter deck planksheer should be flush with the front edge of Bulkhead "G." The fore deck planksheer should butt against the Bulkhead.

Glue the planksheer pieces in place. The upper outboard edge of the planksheer pieces should be flush with the outside of each bulkhead. When in place, add a 1/16"-square basswood strip on the outside edge (see figure 13). After the hull planking is completed, the outer edge of the planksheer can be sanded flush with the hull planks.

## 10. Installing the Hawse Timbers

The hawse timbers can be a single 1/8"-thick piece at the forward end as shown on the plans (also look ahead to figure 22a). Glue the timbers to the top of the planksheer. You can cut the hawse pipe before you install the timbers if desired. Make sure you leave space for the bowsprit to pass through at the bow.

Most of the basic framing is now completed and you should be ready to start planking. Take a moment to look over what you have done so far. Recheck the fairness of the hull. Making corrections now will allow the planking process to go smoothly.

FIG. 11 – Installing the Transom

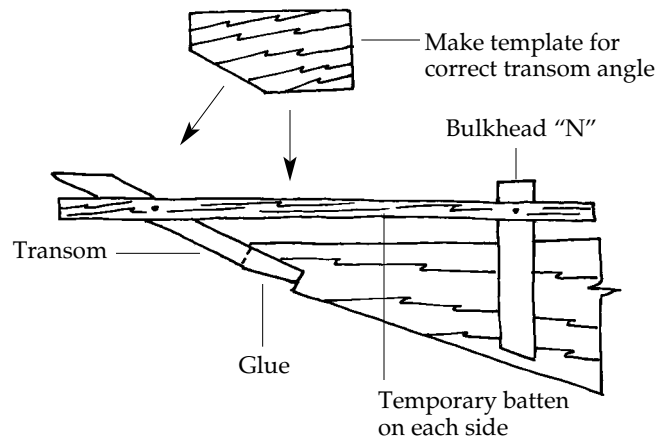


FIG. 12 – Installing Horn Timber Cheeks

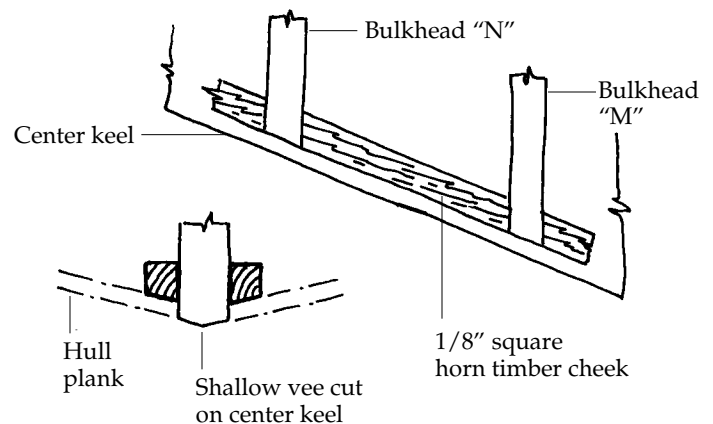
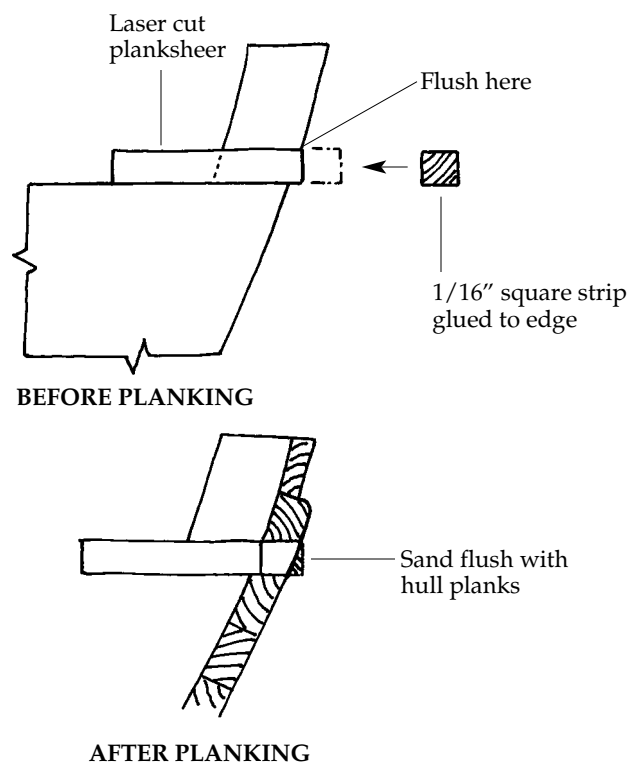


FIG. 13 – Installing the Planksheer



## STAGE B

### PLANKING THE PLANK-ON-BULKHEAD HULL

#### 1. Getting Started

The planking process is tedious and you should plan on spending some time doing the job. Work on each plank as a project unto itself. Rushing will only result in frustration and a poor result.

Since both sides of the hull will be identical, you can cut two planks the same shape at once. Fit one plank at a time to each of the sides. Before starting, place the hull upside down and secure it in a vise or cradle. It would be ideal to use something portable that would allow you to rotate the hull easily.

#### 2. Planking Battens & Belts

The model will be easier to plank if you first divide the hull into a series of "belts." The belts flow along the hull in smooth curves. Each belt is designed so the planks lay against the hull and sweep up at the ends like the deck sheer, lessening the need for excessive edge bending. Within each belt, the planks are usually spaced evenly, tapered, and fitted as required. When selecting a belt width and the number of planks within each belt, you need to consider how the planks will lay against the frames and how they will taper. If the planks are too wide, they will not lay flat on the bulkheads. Also, you will not want them to taper so much that there is no width left for fasteners. This would require substituting a larger plank for two to increase width. Also, in some areas, the planks may get wider rather than taper. If they get too wide, a stealer plank must be cut into the plank. While these alterations are acceptable and are used on many ships, it is best to design the run of planking to limit the number of such inserts (see figure 14).

To save you the trouble, a planking layout has already been developed for the *Benjamin W. Latham* model. The layout is shown on the P-O-B plans. The arrangement shown is based on notes in Howard Chapelle's book, *The American Fishing Schooner* (see number 14 of the Bibliography). Generally, the schooners had about 21 planking strokes per side. The upper strokes had very little taper forward and aft and no stealers were used above the waterline. This was done to improve the appearance of the plank runs.

The *Benjamin W. Latham* model has been designed with Chapelle's observations in mind. The upper belt was kept reasonably wide forward and aft. Stealers are introduced at the stern in the lower belt.

#### 3. Planking Butts

Before you start planking, you need to consider the planking butts. Since the longest length of trees available determined the cut-lengths of wood, available planking was generally shorter than the overall lengths of the lifesize vessels. Shipbuilders generally had to work with planks only 20 or 30 feet long. Some modelers think it is easier to use a plank length the full length of the model, since fake butts can be scribed in later or omitted. Granted, this can be done; it's really up to the modeler. But, there are some excellent advantages to using shorter pieces. Since all planks must taper from midship forward and aft, the use of a short length will allow the marking of the taper to be quick, and the plank easier to fasten into place. Also, a short piece can be held down with one hand. And if you make a mistake, you will have only a small piece to do over. So, the following is based on the assumption that you will use the shorter planking lengths.

FIG. 14 – Planking with Stealers

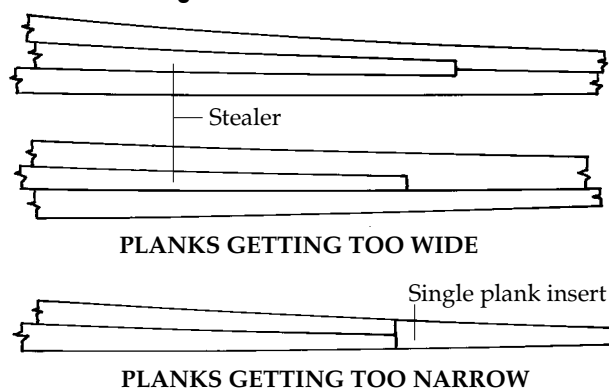


FIG. 15 – Staggering the Planking Butts

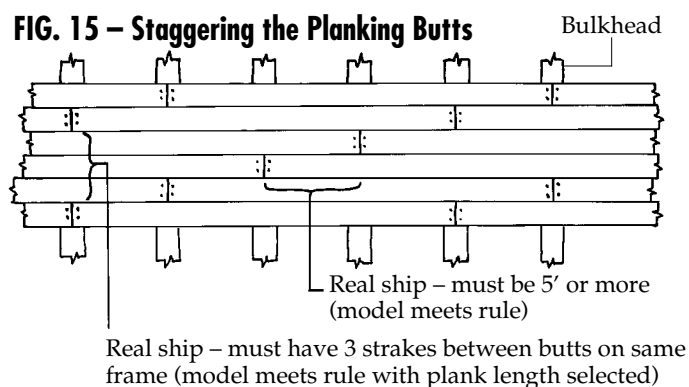


FIG. 16 – Spiling

1. Use compass – run steel point along plank in place and mark parallel line on new plank with pencil end

2. Measure width & mark. Draw curve

3. Cut out plank

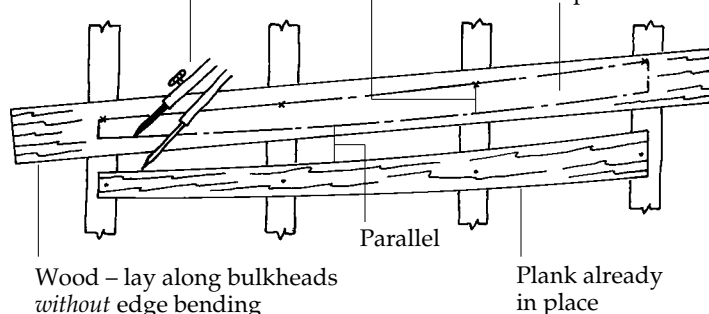
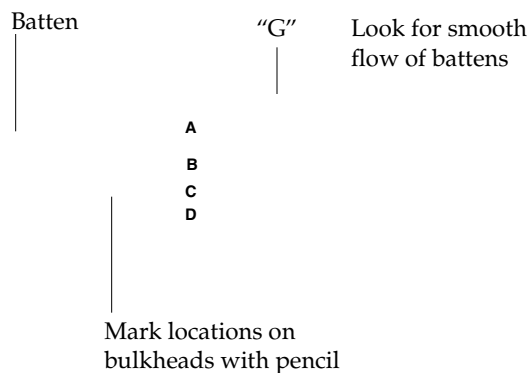


FIG. 17 – Belt Battens



A plank length approximately 6 inches will cover four bulk-head spaces. This is a comfortable length to handle for this model. To scale, it is a plank 24 feet long. However, to avoid having very short pieces at the bow and stern, you may need to use a longer plank to complete the run.

To follow real ship rules, you should stagger the butts on the model (see figure 15). The sketch shows a stagger sequence which is similar to that of real ships. The stagger also applies to the deck planking. The 6-inch plank works well with the rules. With this length you can meet the rule for three full plank widths between butts on a single frame. Had you used a plank length to cover only three bulkhead spacings, this would not be possible. Because the butts occur on bulkheads, you would wind up with only two full planks between the butts.

## 4. Spiling

On real ships, more so than on models, edge bending is limited. The wood may be very stiff, so each plank must be cut to shape. Spiling is the term used for laying out the cuts (see figure 16). It's simply a matter of transferring curves to a straight plank, then sawing the plank to shape. For the *Benjamin W. Latham* model, the wide planks landing at the sternpost should be the only strakes you need to spile. For narrow planks, the basswood strips are flexible enough so they can be edge bent into place.

## 5. Fastening the Planks

There are some fancy plank clamps on the market, but they are more trouble than they are worth. They must be screwed into the edge of the bulkheads, leaving a big hole to contend with when doing the next plank. Instead, you can hold the shorter planks in place, or position them with straight pins. Be careful not to split the plank when using straight pins. If necessary, drill a small pilot hole first. Glue each plank to the bulkheads, and edge glue them together. For the edges, use white or carpenter's glue so that setting will not occur too fast. At the bulkheads, it is good to use thin super glue to quickly secure the plank in place.

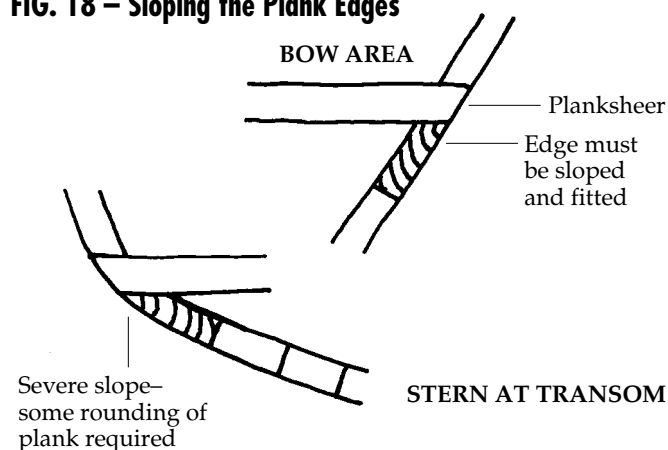
While glue alone will hold the planks, you may wish to use small brass brads or wooden trenails for additional holding power, or just for looks. Using fine brass brads, cut off and discard the heads, then hammer them into place. If trenails are desired, you can buy them commercially. Better yet, get some long bamboo skewer sticks, strip off small pieces, then pull them through a draw plate until you have very small dowels. Drill holes for the trenails, add a touch of glue and drive them into place. Trenails are good if you want to add them for each frame. While there are no frames, only bulkheads, use the bulkhead stanchions for locating where the frames would be.

## 6. Planking the Outer Hull

**Belt Layout:** Now the fun begins! From the Hull Planking Layout drawing, use a tick strip along each bulkhead location and mark the belt seams. Using a tick strip, transfer the location of the belt seams onto each bulkhead and mark them with a pencil. Next, lay the battens (1/16" x 1/8" x model-length basswood strips) along the marks and temporarily tack them in place.

The purpose of the battens is to assure an accurate flow of the belts. Even though the Hull Planking Layout was developed to provide an accurate flow of belts, errors in drafting and tick strip marking may occur. The battens were designed to assist in this regard. With them in place, any errors previously made can be corrected. Also, you may not like the flow and desire to change it to suit your own taste.

**FIG. 18 – Sloping the Plank Edges**



With all the battens in place, visually check their flow. Look at the model from the side and from the bow and stern. Do the battens have nice smooth curves? Adjust them if necessary (see figure 17). The sketch shows what they should look like from the side. When everything seems okay, remark the belt seam lines on the bulkheads, making sure they are clearly indicated. You do not want to lose them. You may now remove the battens. It would be a good idea to leave the middle batten in place temporarily to help secure the hull so it won't warp before it is planked.

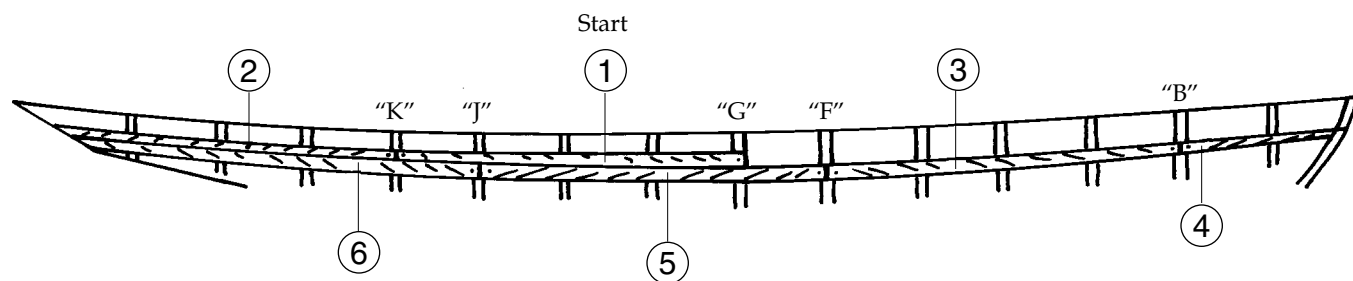
**Sloping Plank Edges:** As you proceed with the planking, you may need to slope the edges of a particular plank so it butts flush against the adjacent plank. This is especially true for a plank adjacent to another member intersecting at an angle. For example, the first plank below the planksheer at the bow should butt against the planksheer at an angle. At the stern, the angle is even more severe. The edges of these planks must be trimmed so they fit against the planksheer (see figure 18).

To begin with, all the planks on the hull have square edges. When butted against each other on a round hull form, a small gap will appear between each plank. Most of the gaps eventually will be filled with glue, or you may fill them with wood filler. On a real ship, the gaps are caulked. In fact, the edges of the planks are often sloped to increase gapping. This measure assures that the inside of the planks butt against each other, while on the outside there are sufficient gaps for caulking. If you want a perfectly smooth hull without the gapping, you must trim the edge of each plank as you fit it. It's a lot of work but your decision.

**Laying the Planks in Belt A:** Each belt of planking should be done separately. Consequently, you can start with any belt. For discussion, let's start at the top and work down. **Belt A** has six planking strakes below the planksheer forward of the deck step. Aft of the deck step, there is a seventh strake. The extra strake fills the space caused by the deck step which raises the planksheer on the quarter deck. The maximum plank width is at **Bulkheads G** and **H**. The planks here should taper both forward and aft. All the planks can be cut from 1/4" x 1/16" strips. They should be slightly over 3/16" wide amidships, tapering to about 1/8" at the bow and 3/32" at the stern. Full size, the maximum width is about 10 inches.

Use a tick strip and lift the plank widths from the Hull Planking Layout. If you have changed the locations of the battens, first mark the position of the seventh aft plank below the planksheer and in line with the forward planksheer. Then, simply divide the remaining space into six equal plank widths at each bulkhead. A set of proportional dividers would help. Mark these lines on the bulkheads with a pencil. You should now have a completely marked area for **Belt A**.

**FIG. 19 – First Two Strakes in Place**



The next step is to cut planks to fit between the marks. **Belt A** will not require spiling, so straight tapered planks can be made. Start at **Bulkhead G** and install the upper plank under the quarter deck planksheer. Use two planks, one from **Bulkhead G** to **K**, and another from **K** to the transom. First, lay a piece of planking material over the bulkheads. Using a pencil, mark the lengths at each of the bulkheads. Next, use a set of dividers, or a tick strip, and lift the plank widths from the marks on the bulkheads and transfer them to create each plank. Draw a line through the points and cut the planks. You should now have tapered planks. Trace these planks to obtain those needed for the other side of the hull.

Install the planks you've just cut on the hull, butting them up against the planksheer. Where the planking does not fit flush up against the underside of the planksheer, trim the plank edges so they do fit. Glue and fasten them into place.

Continue the same process for the next strake below. This time, the strake will go from the bow to the stern. Stagger the butts for this strake. Install a plank from **Bulkhead F** to **B**, **B** to the stem, **F** to **J**, and **J** to the transom. You will have four planks making up the strake from bow to stern (see figure 19). At the stern, some planks must be twisted into place. They should be steam bent if the twists are severe.

Move down to the next planking strake and work as before. Stagger the planking butts, starting at **Bulkhead E**. Continue until this strake is complete, then complete the other strakes in **Belt A**.

For now, let the aft ends of the planks that rest on the transom extend just beyond the transom. When you plank the transom, the transom and hull planks will meet in a miter. More on this later.

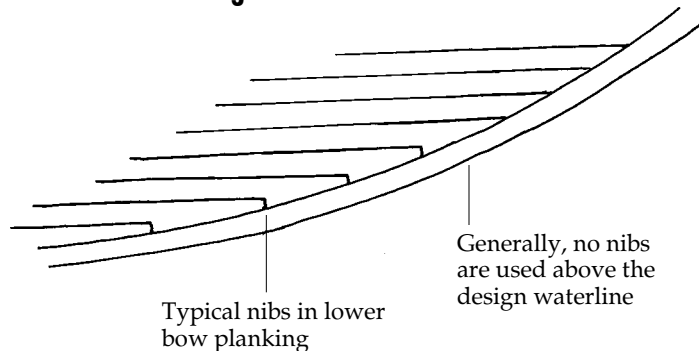
**Laying the Planks in Belt B:** **Belt B** is very similar to **Belt A** in that it has six planking strakes about the same width. If you have not removed the temporary batten, do it now. Then you may start the planking process for **Belt B**. Remember to stagger the butts.

At the stern, a few planks should land on the transom bevel, and the others should butt against the side of the horn timber (our center keel) and up against the horn timber cheeks.

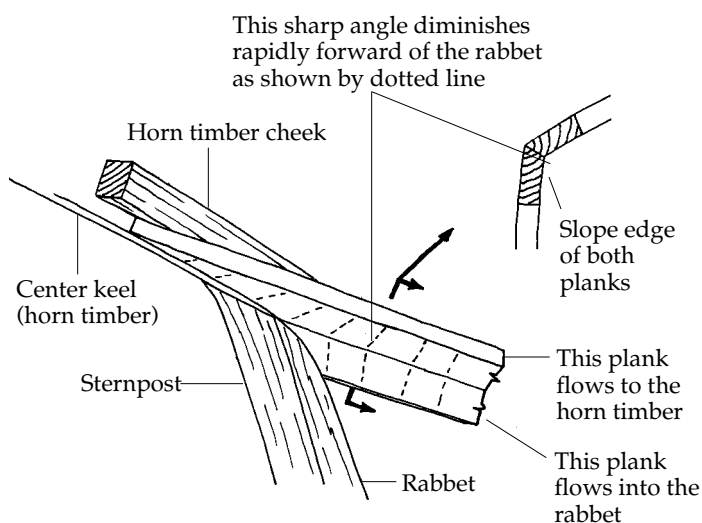
At the bow, the planks feather out at the stem rabbet rather sharply. This is fine for the model, but there is an option. Many real schooners have nibs in the planking forward (see figure 20a). You can do this if you desire. This also applies to **Belts C** and **D**. See the profile detail on the plans.

**Laying the Planks in Belt C:** **Belt C** is also similar to **Belt A** except that the planks do not taper as abruptly at the stern. At the intersection of the horn timber and the sternpost, there should be an abrupt change. One plank should flow to the horn timber. The plank below it should flow into the rabbet at the stern-

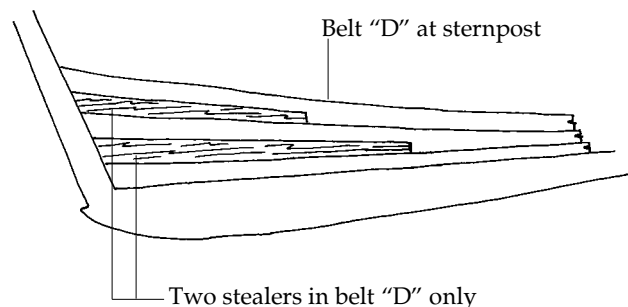
**FIG. 20a – Planking Nibs at Bow**



**FIG. 20b – Planks in Belt "C" at Stern**



**FIG. 20c – Planks in Belt "D" at Stern**





post. These two planks must have their edges sloped so they meet flush (see figure 20b). **Belt C** also has some twists, so steam bend them in place if necessary.

**Laying the Planks in Belt D:** This belt will contain the garboard strake (next to the keel) and two other strakes. It also will contain two stealers in order to reduce the width aft (see figure 20c). All the planks here will be very wide and must be spiled. You will need to use the wide planking strips provided in the kit. Also, you will find that in order for these planks to fit in place, a severe twist must occur. The planks will have to be steam bent to obtain the right shape.

The stealers could have been placed in **Belt C** rather than in **Belt D**. However, since the tendency of the lower batten is to naturally flow upward as it goes aft, placing the stealers in the lower belt is more logical.

## 7. Plank Variations within a Belt

If you are working within a belt, and have five planks exactly the same width, and then find that the last plank in the belt needs to be made slightly wider to complete the belt ... should you worry? Certainly not. No planking job, even on real ships, is that precise. You are dealing with hand-cut planks. The important thing is to keep the flow of planks smooth. A variation in widths is of no great concern.

## 8. Planking the Transom

For the model, the side hull planks can be extended past the transom and the transom planks butted into the hull planks or vice versa. However, on the real ship, the transom plank meets the hull plank in a miter joint. If you elect to do this, first cut the ends of the hull plank that you left hanging over, then add the 1/16" thick transom planks. Cut the miter on each plank, then glue them into place (see figure 20d). You could also cut the miter as you add each side plank.

Plank the inside of the transom with 1/32" stock after the deck planking is installed. Run the transom planks over to the inside of the bulwark planking.

## 9. Planking the Bulwarks

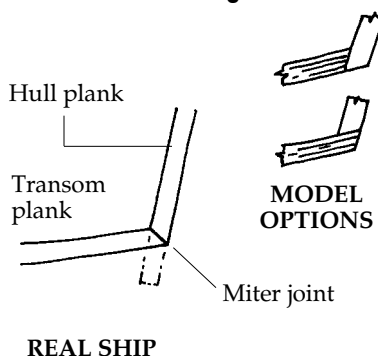
The planks between the planksheer and main rail will be in two thicknesses. From the planksheer to the waist (see location on plans), use 1/16"-thick material. Above the waist, use 1/32"-thick material. The bulwark planks are fairly uniform and will not require any severe tapering forward or aft. First, fit the 1/16" plank. This will need a jog in it at the deck step as shown on the plans. Next, fit the 1/32" plank. You may let it extend slightly above the stanchions. Then, trim it flush with their tops.

**Scuppers:** Later on in these instructions, there is a discussion on how to cut or otherwise treat the scuppers which go through the bulwark planking. If you intend to install the scuppers, now would be a good time to do it. Cut the scuppers in the edge of the 1/16" planking before it is installed on the model (see page 21).

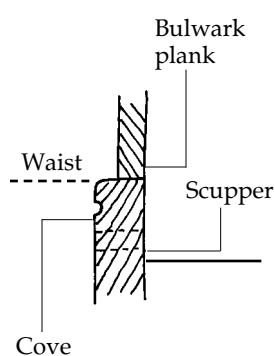
**The Cove:** Another detail that can be done now before the planking is installed is the cove, a thin hollow molding, located just below the waist (see figure 20e). This was an important aesthetic feature of the fishing schooner and accentuated the low profile and graceful sheer of the hull. The cove can be scribed with a sharp steel point and straight edge. If you elect not to scribe in the cove, do not fail to paint it on (generally, it was gilt).

**Fashion Piece:** At the transom, there is a fashion piece that must be fitted (see figure 20f). The piece is 1/32" thick, and should be added over top of the already installed 1/32" plank.

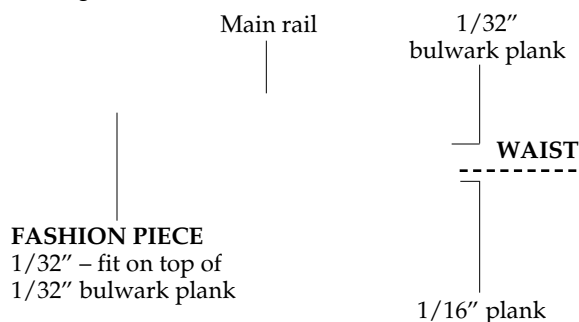
**FIG. 20d – Planking the Transom**



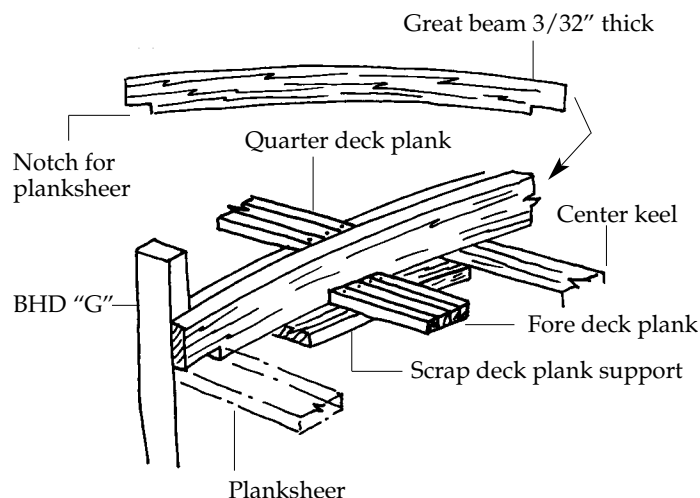
**FIG. 20e – The Cove**



**FIG. 20f – Fitting the Fashion Piece**



**FIG. 20g – Installing the Great Beam**



## 10. Planking the Deck

**The Great Beam & Plank Supports:** Before laying any deck planking, you must install the great beam (also called a Grub beam by Essex shipwrights) at the deck step. You must also add some supporting members under the great beam and under the edge of the planksheer to provide support for the ends of deck planks. Cut the great beam to the deck camber curve. The great beam butts against **Bulkhead G** and projects 1/16" above it. When the quarter deck planks are installed the planks will be flush with the top of the great beam. Notch the ends of the great beam to fit over the fore deck planksheer (see figure 20g). The sketch shows the construction of the great beam and the supports (see also figure 21).

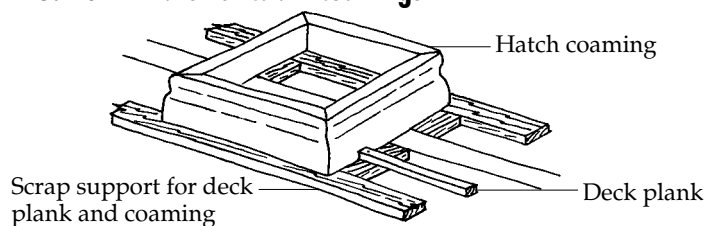
**Hatch & Cabin Coamings:** Before planking, you must decide how you want to treat the hatch and cabin coamings. A recommended approach for doing it the way it was done on the real ship, is to install all coamings first. You can then plank around the coamings. On the underside of the coamings, insert some scrap wood so the deck planking has a support for gluing (see figure 20h).

**Deck Planks:** The deck planks should be 1/16" square. The size may seem small for the scale of this model, but this particular fishing schooner did have very narrow planks. On earlier schooners, the planking was much wider. The change was made to improve the watertightness of the deck.

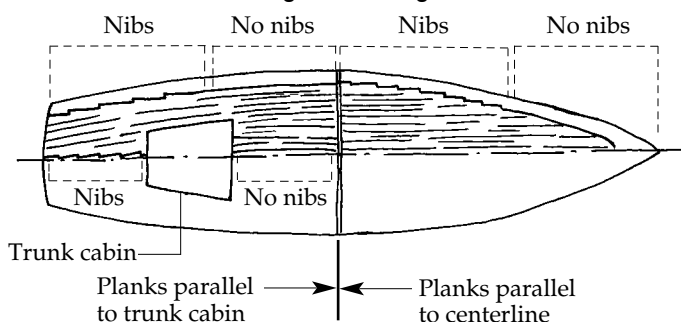
Prepare the strips by painting one edge black or dark brown. When the planks are glued together, this will simulate caulking in the seams. You may also use a brown colored carpenter's wood glue on the edges of the planks. When dry, this glue is dark enough to simulate the caulking.

**Thick Pads:** There are several thick pads on the deck as shown on the plans and in the sketches (see figures 21 and 22a). These can be made of thicker planks that are added as you lay the deck, or you may add planks over top of the regular deck planking. It's your choice.

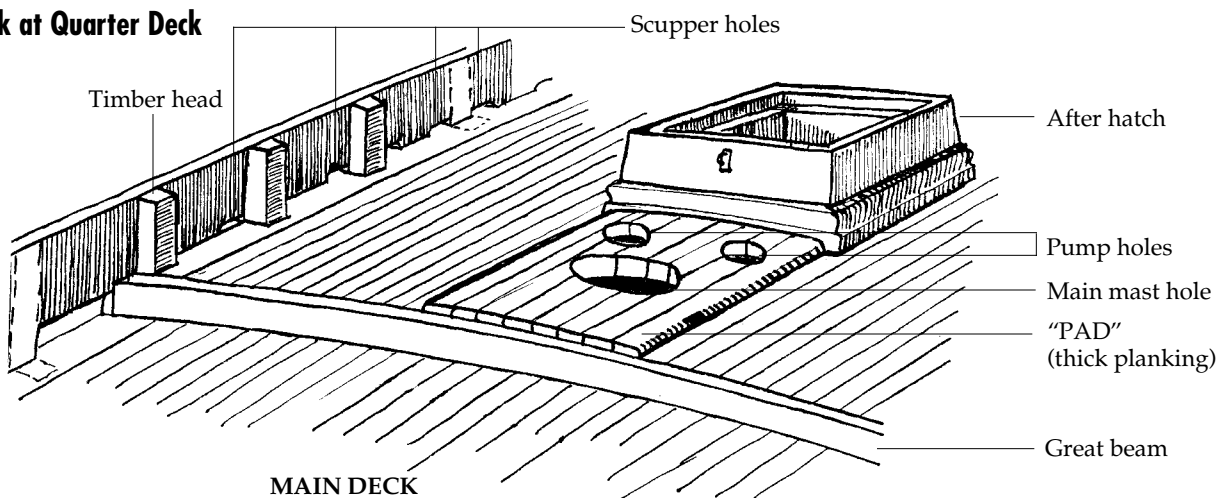
**FIG. 20h – Hatch & Cabin Coamings**



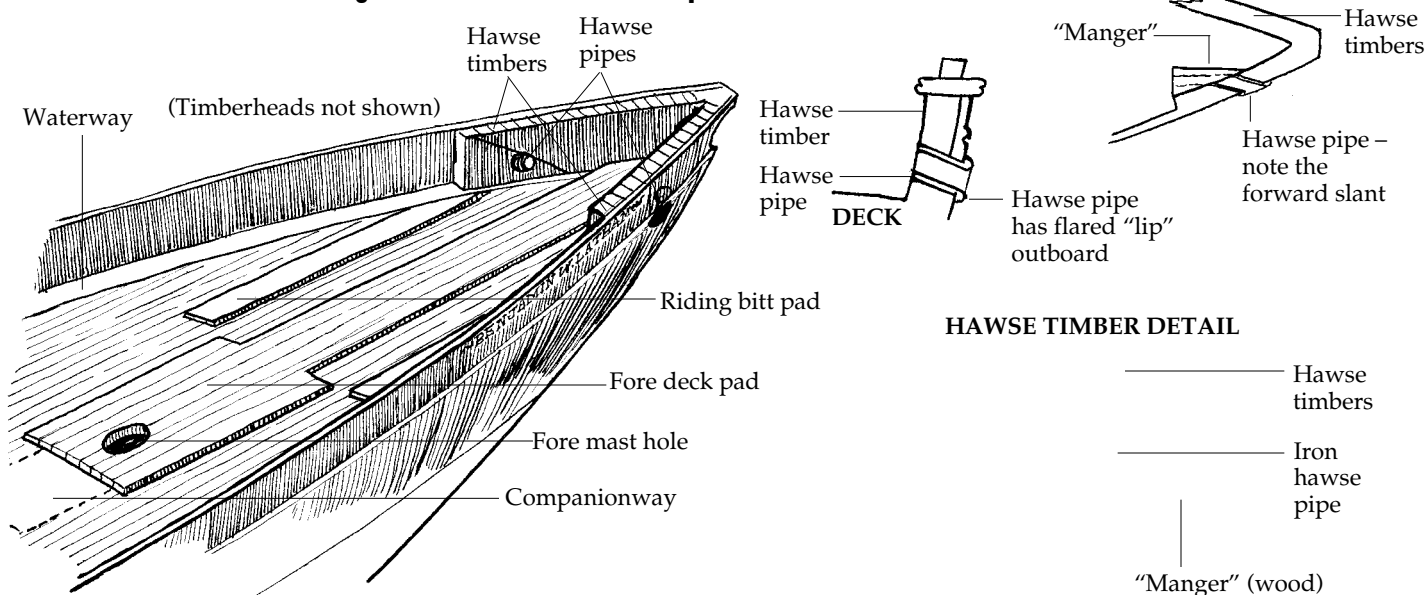
**FIG. 20i – Deck Planking Nib Arrangement**



**FIG. 21 – Break at Quarter Deck**



**FIG. 22a – Fore Deck Showing Pads & Hawse Timbers (Cap Rails Omitted)**



**Procedure:** The fishing schooners had a very unusual deck planking layout and nibbing arrangement, so follow the plans carefully (see figure 20i also). Cut the nibs into the edge of the planksheer as you go.

The fore deck plank should be laid parallel to the centerline. Start at the centerline and work outboard. Scrape off any glue squeeze-out before going to the next plank. Planking butts can be used, like the outer hull, or they may be omitted. On a real ship, they do not show up as readily as the seams do. You may also scribe butts after the planking is laid. Since there is no cutting or curves involved like the hull planking, using long deck strips is no problem. Use brads or treenails if you like. See Hull Plank discussion.

The quarter deck should be laid parallel to the trunk cabin sides. You will end up with nibs at the centerline, as well as some at the planksheer.

## STAGE C

### COMPLETING THE BASIC HULL STRUCTURE

#### 1. Correcting & Sanding

After all the planks are installed, look over the entire hull. If you find seams with starved glue joints, rub some wood glue in the cracks, and if necessary, add some wood filler. When seams are filled, sand the entire hull and deck planking until they are smooth. Addition of the rails and details will be covered under Stage E.

#### 2. Natural Wood/Double-Planking Option

Most wooden ships have single-thickness planking. The model of the *Benjamin W. Latham* is designed with this in mind and is intended to be painted the colors of the real ship. However, many modelers are familiar with the European double-planked kits, or may want to have a natural wood-tone finish on the hull, which is typical of the Admiralty type models. Also, after the planking job is completed, some modelers wish to try again to improve the looks of the job.

If for any reason you desire to double-plank over the basswood planking, thin wood strips in mahogany, walnut, or some other types of exotic hardwood can be purchased from Model Expo to complete the task. For the *Latham*, you will need 80 strips sized 0.5mm x 5mm x 20 inches long. This amount includes about 20 percent increase for waste and errors.

The strips are only available in up to 5mm widths. Consequently, you will need to double-up or glue two strips side by side to arrive at the correct width for some of the wider planks.

The natural wood planks will cover the existing planking, but you still will have a basswood planksheer, main rails, and upper rails exposed. Instead of initially using the basswood for these details, you could make a substitution with the wood of your choice. You could also cap them with the double-planking strips, or simply stain them to look similar.

When applying the strips, proceed exactly as you did for the basswood planking process. You may want to work with longer strips since the basswood planking already defines the plank shapes. Simply lift dimensions from the hull and cut the natural wood strips. When completed, sand and finish the hull with Model Shipways oil or glaze, or tung oil. Finally, add a coat of wax and then polish it.

## STAGE D

### MOUNTING THE HULL

Before going on, it is best to mount the hull to prevent details from becoming damaged during handling. Any alignments that require a true waterline will be easier to do. Any modeler may devise his own mounting or purchase mounting kits commercially. This kit contains two pedestals for use with a mounting board which you must make or purchase separately. Model Expo's Item No. RH4530 30" x 5-1/2" Routed Red Oak base is ready for staining and highly recommended. It's size will accommodate both the *Latham* schooner and its seine boat. A second mounting option is the launching ways.

#### 1. Mounting Board with Two Pedestals

If you've decided to make your own baseboard to use with the kit's two brass pedestals, it must be made long enough to mount both the schooner and seine boat (a minimum of 30" in length). With baseboard in hand, round off the top edges or cut a simple chamfer (taking the edges off or beveling them). If you own a router, or can borrow one, you will be able to cut a nice fancy edge on the baseboard. Finish the base with a dark stain or paint.

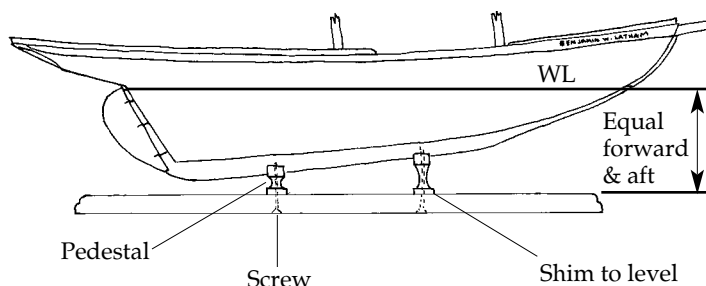
Next, drill the pilot holes for the pedestals and support dowels for the seine boat. Working with a 30" long board, drill the first pedestal hole 9 inches from the end at width center. Space the next one 12 inches from the first toward the stern. At the opposite end of the board drill a first dowel support hole 4 inches from the end just 2 inches off the port or starboard edge of the baseboard. Drill the next hole 5 inches from the first toward the bow. If you have correctly drilled the pilot holes for the pedestals, the model should sit with the waterline parallel to the baseboard (see figure 22b). If the balance is off, you can add a brass shim under one pedestal to correct it. Visually align the seine boat.

#### 2. Launching Ways

Launching ways are mostly suitable for models without sails. Make them from scratch or purchase a kit commercially. Drilling of the keel is still required to apply the rods that anchor the model to the ways. The launching ways are easily assembled and should be mounted on a minimal board size of 24" x 6". (Expanding the size of the board will allow you to create a mini-diorama comprised of boat yard ground activity. This would be good for the *Latham* model so you could lay the seine boat to rest beside the ways.) Follow the directions supplied with the ways to achieve the proper waterline level.

Note: It is recommended that either choice mounting piece be finished before mounting the Hull Assembly into place.

**FIG. 22b – Mounting the Hull using Baseboard & Pedestals**



## STAGE E

### ADDING THE HULL DETAILS

Before beginning with the details, outline all topside items on the deck by marking their locations with a pencil. Take all measurements from the plans using tick strips. Proper locations should be measured from some firm "bench mark" such as a mast hole or a station line marked on the deck. Add all equipment on or near the bulwarks first, before adding those near the centerline.

#### 1. Timberheads (or Bulwark Stanchions)

These members comprise an extension of the hull frame and give the bulwarks their form and strength (see figures 23 and 26). During the building of the Plank-On-Bulkhead hull, every third bulwark stanchion was included as part of the bulkheads. You now must add two additional "fake" stanchions, and taper them exactly to the shape used for the bulkheads. Glue them in place. Scrape off any glue squeeze-out. Let them dry before proceeding to the main rail.

#### 2. Main Rail

This rail runs the full length of the vessel, capping the bulwarks and the timberheads (see figures 23 and 24). The railing along the sides and around the bow and stern must be cut from the sheet stock and very carefully joined. Simple scarf joints are recommended, together with careful gluing and pinning. Note that the outboard side of the rail protrudes beyond the bulwark planking; likewise, the inboard side covers the timberheads with a slight margin of overhang.

#### 3. Rail Moldings

The edges on the rails of many fishermen had simple moldings, usually super-imposed "half-rounds" (see figure 25). If the model maker wants to contrive scrapers or some other device to form these, his efforts would be well rewarded. Detailing of this sort adds much interest and challenge to the work. Otherwise, especially for the beginner, a neatly sanded rail edge with neatly rounded corners will suffice.

#### 4. Buffalo Chock

This is a very simple log rail on top of the main rail, port and starboard, at the bow (see the plans and figure 30). It should be square or rectangular in cross-section and taper aft slightly. Taper the rail first, planing and sanding it lightly. Next, file the ends to their proper shapes. Soak or steam the pieces and bend them to fit the main rail. Then fasten them down with glue and pins.

#### 5. Monkey Rails

Fit the monkey board first (see figure 26). This is made from  $1/16'' \times 1/8''$  for the sides. The section over the stern should be cut from a  $1/8''$  block. Piece the corners. Over this is placed the monkey rail which can be made from  $1/16'' \times 1/8''$  strip-wood planed down to  $3/64'' \times 1/8''$ . This rail is made in much the same way as the main rail. However, steam bending the side portions may be preferable to cutting them from sheet stock.

Over the monkey rail is placed the monkey log, made from  $1/16'' \times 1/16''$  strip-wood. Note that part of the port monkey log is omitted to make room for the seine roller. Follow plan sheet 1 of 4 closely on this matter.

FIG. 23 – Railing at Main Deck Deck

Main rail –

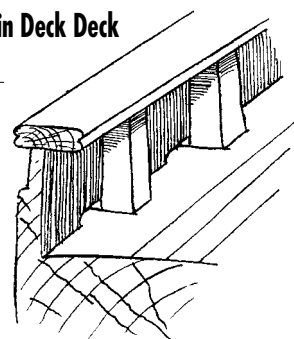


FIG. 24 – Railing Joiner Work

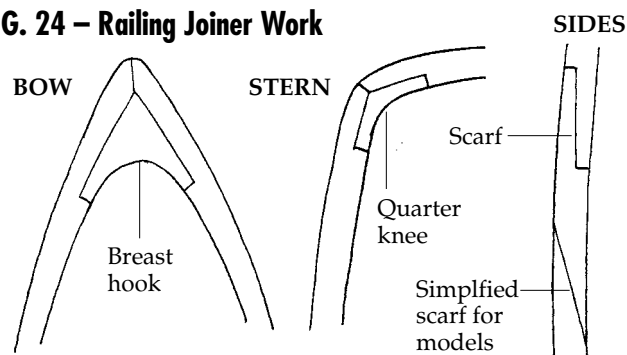
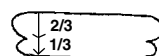
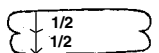


FIG. 25 – Some Common Railing & Superstructure Moldings

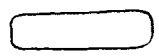
#### CAP RAIL MOLDINGS



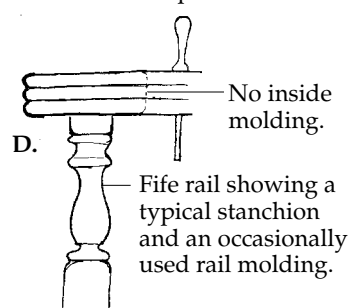
A. Traditional "hawks bill" molding (called "dirt catcher" in the gloucester area.)



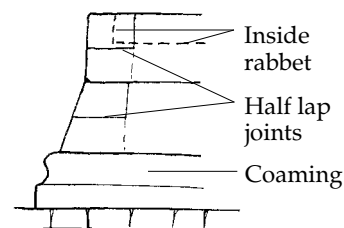
B. Cruder style of "hawks bill" molding. Very common among fishermen.



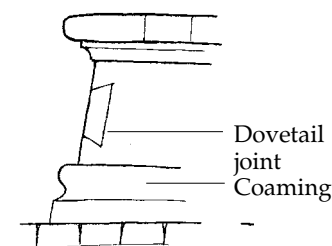
C. No molding. Crudest & cheapest.



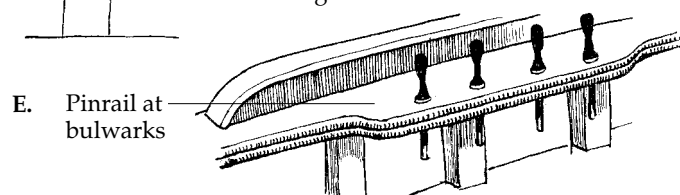
D. Fife rail showing a typical stanchion and an occasionally used rail molding.



F. HATCH



G. TRUNK CABIN (end view)



Note: on bulwark rails, it was common to use the same moldings on both inboard and outboard edges, including the bulwark pin rails. This is not usually the case for the fife rails at the fore and main masts.

## 6. Main Pinrails

These are simple swellings of the main rail on its inboard sides abreast of the main mast which hold the belaying (see lower right of figure 25). Note dimensions and their location on the hull plan. No alterations to the main rail are necessary for fitting the belaying pins at the fore shrouds.

## 7. Boom Jiber Box

This is an extension of the taffrail (main rail at the stern) and should be blended smoothly with it. Install the support chocks and prime and paint the area within them (check the color scheme in the section on Painting and Staining the Model). Then install the boom buffer hardware (also primed and painted). With this finished to your satisfaction, glue down the jiber box top, making sure that the block ring for the main sheet aligns properly with the opening. Since this detail is now essentially complete, be sure that you are satisfied with your workmanship, because these parts will be quite inaccessible later, if repairs are needed or afterthoughts begin to haunt you.

## 8. Scuppers

As can be seen on the bulwarks and rigging profiles of the plans, the bulwarks of the *Benjamin W. Latham* are pierced with many scupper holes. These openings on the real ship permitted rapid drainage of water which frequently found its way over the lee rail in heavy weather. They measured 1" x 5" but on the model are mere slits measuring 1/50" high x 1/10" long. One of the greatest pitfalls encountered in the modeling process is creating these holes grossly over scale. If you feel confident that you can drill or punch them out and retain a true-scale effect, go ahead and try it. Otherwise, a convincing effect can be produced by making slight indentations in the bulwarks on the outboard side, using an old small screwdriver that has been ground down to 1/10" in width and sharpened to a chisel edge. Scribe lines outboard at main and quarter deck levels and locate the scuppers so they lay on either or both sides of the timberheads as shown on the plans. Remember, the holes were meant to let water out, not three pound mackerels! As noted earlier in the instructions, you may cut the scuppers before installing the bulwark planking.

## 9. Rudder

The rudder is of the plug-stock type and is provided laser-cut in the kit. It should be securely bolted to the rudder/stern post, which is a round wooden plug that pivots on the rudder's true axis. Fit the stump-ends of the stern post's upper and lower parts into blind holes drilled in the center keel. The lower end should be tapered and fastened neatly to the rudder blade with glue and pins. Notch the hinge-side of the rudder as shown on the plans and add the pintles (see figure 27). Mark the corresponding locations of the gudgeon straps on the stern post and make, or "fake", the gudgeons to suit your preference. The rudder can now be installed, but it is advisable to prime and paint it, together with the stern post, before final installation.

## 10. Cleats & Snatch Cleats

With the outboard woodwork of the hull done, the deck structures now may be made and fitted. First, finish up the bulwarks by making the numerous cleats and snatch cleats from strip-wood leftovers (see plan sheet 3 of 4 at top middle section and figure 31). Then glue them to the timberheads as shown on the plans. Follow these locations closely. Next, carefully paint the bulwarks (white). Apply two or three coats according to directions on the paint container. Leave no nook or cranny unpainted. Paint the rails, too. Then drill them with holes for the belaying pins and eyebolts which will be installed later.

FIG. 26 – Railing at Quarter Deck

Monkey log  
Monkey rail  
Monkey board  
Main rail

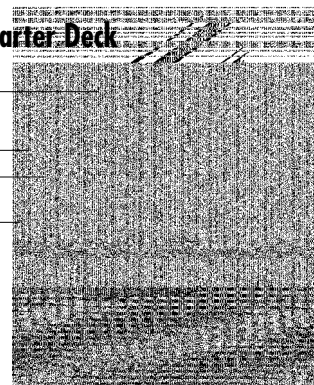


FIG. 27 – Pintles & Gudgeons, Connecting Rudder & Sternpost

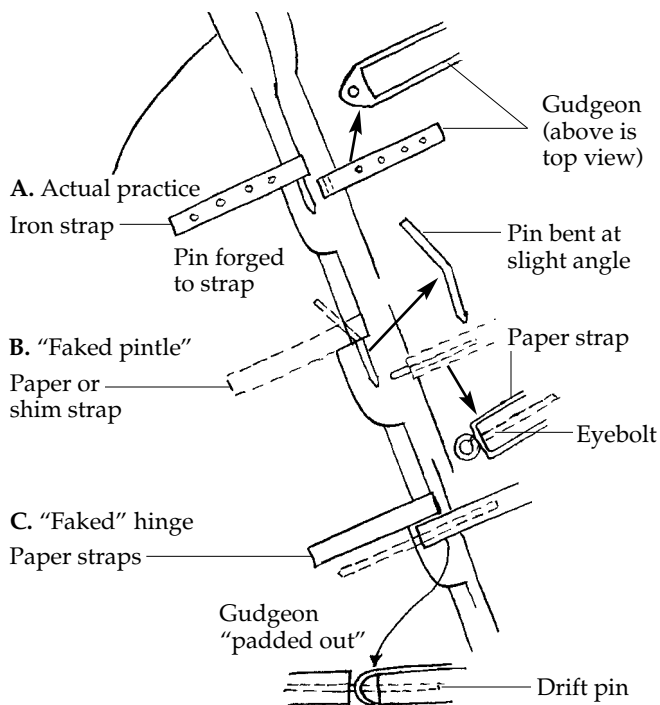


FIG. 28 – Fitting the Bowsprit

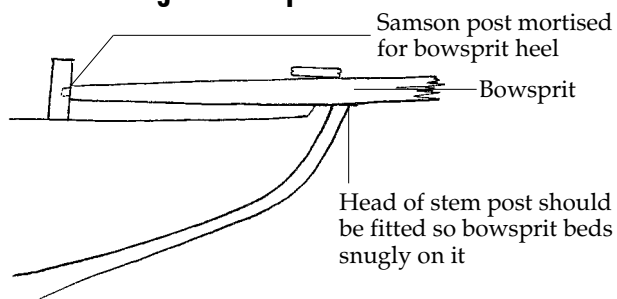
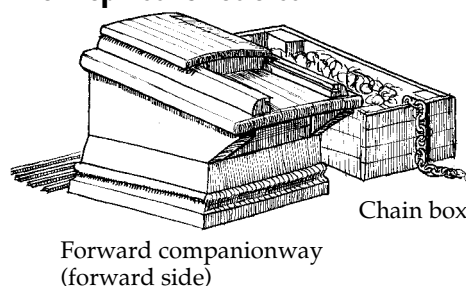


FIG. 29 – Built-up Deck Structures



## 11. Bowsprit

At this point, the bowsprit should be made. See the section on spar making for various construction methods. Next, make the samson post and fit it very snugly into the deck. After this is done, the bowsprit heel socket should be carefully located on the post's forward side. Take the post out and mortise the socket into position. Then cut a tenon into the bowsprit heel. Next, replace the post and test fit the bowsprit. Check the bowsprit for the proper steeve (the angle that a bowsprit makes with the horizon or the keel). If the angle is off, make a new samson post, correcting the position of the heel socket (see figure 28).

## 12. Hawse Pipes

Drill out the hawse pipes for the anchor cables and fit the man-agers inboard (refer to figure 22a). The hawse pipe lips furnished in this kit may now be added to the outboard edges of the hawse holes.

## 13. Hatches, Forward Companionway, Trunk Cabin & Wheelbox

If you elected to add the various hatch and cabin coamings during the deck planking process, you will now need to complete the hatches and build the wheelbox, companionway, and trunk cabin for fitting on top of the coamings. If you planked the entire deck without providing the coamings, you'll need to make the complete units and glue them on top of the deck planking after carefully marking their positions.

This kit provides only strip or sheet wood to construct these furnishings. Consequently, these items must be built up. Follow the plans for the various shapes and moldings shown on the plans (see also figures 21, 25 & 29). As an option, you could cut the cabin and companionway from solid basswood or pine blocks onto which you would then add the various moldings. Use of blocks was common in older Model Shipways kits with solid wood hulls. Each modeler is pretty much on his own as to how he wishes to make these deck furnishings. Let ingenuity and a desire for detail be your guides. For beginners who feel equal to the task, review earlier paragraphs on moldings and add these to the hatch coamings and cabin sides.

When the individual items have been completed, prime and paint them, and then set them aside to dry.

## 14. Skid Battens

Next, cut pieces of 1/32" x 1/32" strip-wood to specified lengths and glue them to the decks to serve as skid battens, as shown on the deck plan. Use the deck structures you have just made as guides for the precise placing of the battens.

## 15. Deck & Rail Fittings

Sort out and identify the various castings for the deck and rails. After assembly, priming and painting, set them in their proper locations. Drill and socket where necessary (see plans for locations). The fittings are as follows:

Cat Head: (see figures 30 and 31)  
Anchor Catted: (see figure 31)  
Windlass: (see figures 32, 33 and 34)  
Pump: (see figure 35)  
Boom Buffer: (see figure 36)  
Steering Wheel: (see figure 37)  
Propeller: (see figure 38)  
Exhaust Pipe: (see figure 39)

FIG. 30 – Iron Cathead

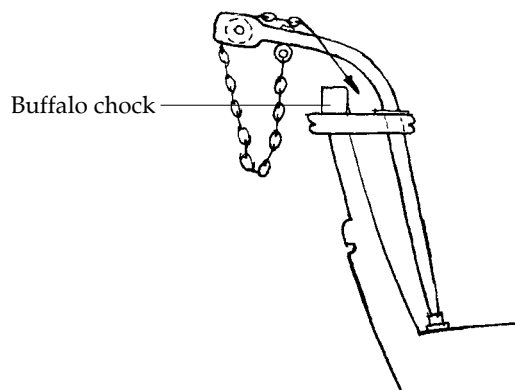


FIG. 33 – Windlass, Aft View

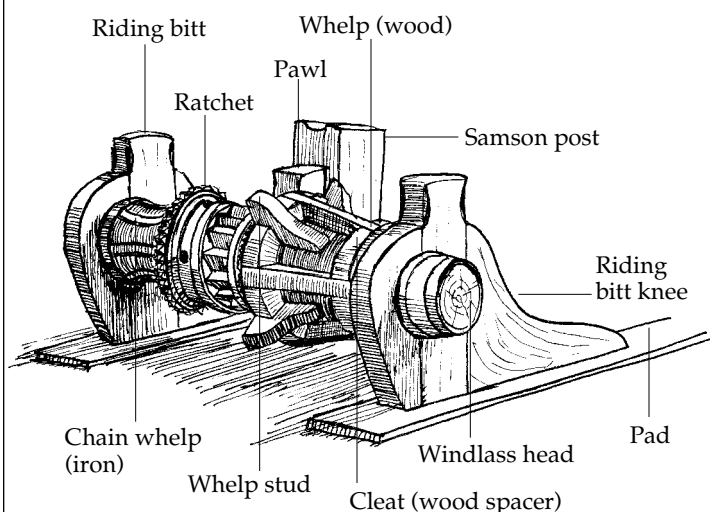
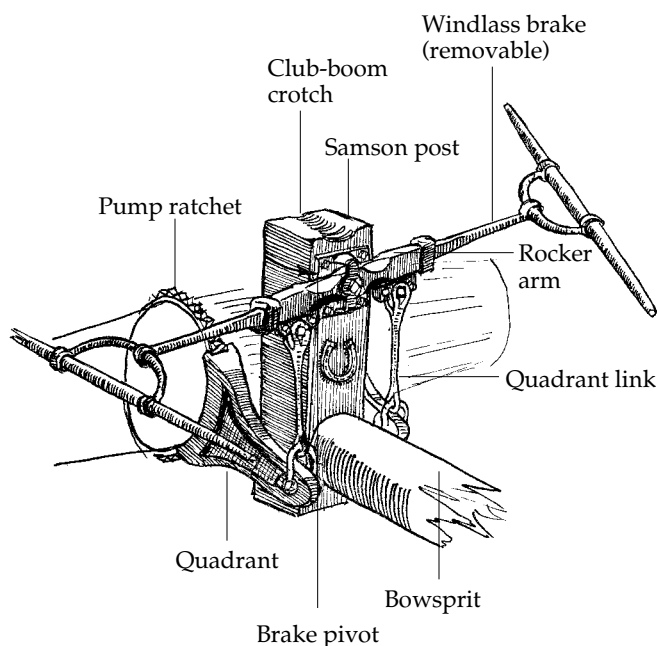
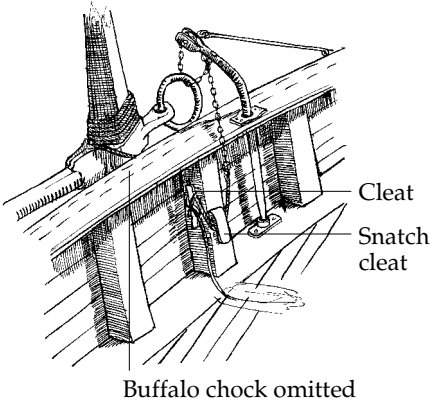


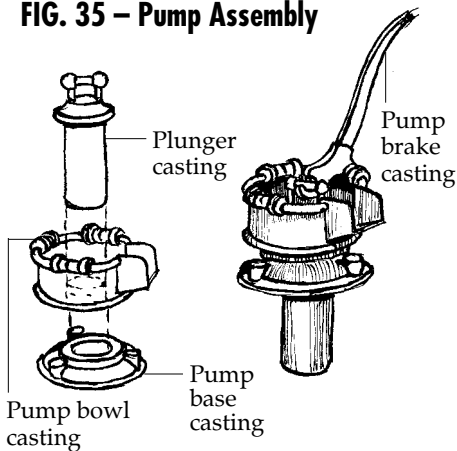
FIG. 34 – Windlass Pump, Forward View



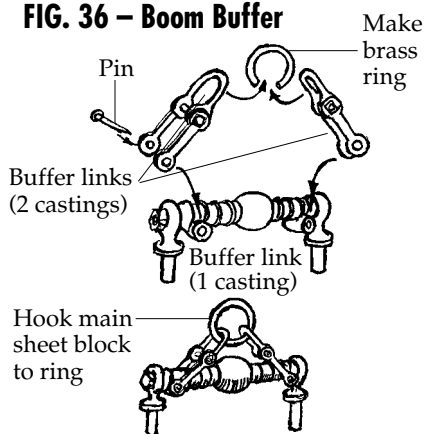
**FIG. 31 – Anchor Catted**



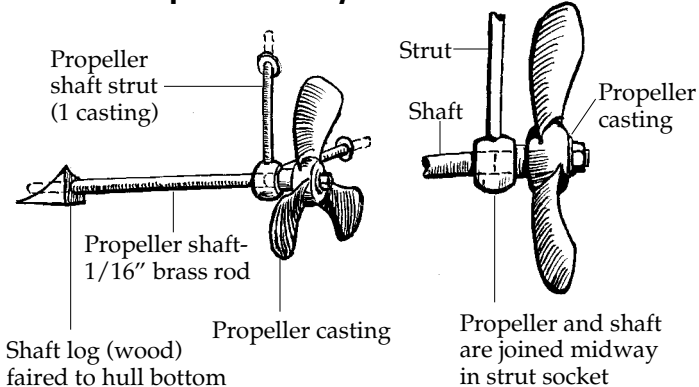
**FIG. 35 – Pump Assembly**



**FIG. 36 – Boom Buffer**



**FIG. 38 – Propeller Assembly**



**FIG. 32 – Assembling the Windlass & Bitt Support Mechanism**

**WINDLASS ASSEMBLY**

Windlass barrel (1 casting)

Quadrant (2 castings)

Clasp (wood)

Rocker arm (2 castings)

Samson post (wood)

Rocker arm (1 casting)

Pivot (1 casting)

Make parts from brass wire (supplied)

Solder

**QUADRANT LINK ASSEMBLY**

See plans, sheet 1 for actual dimensions (assembled soldered)

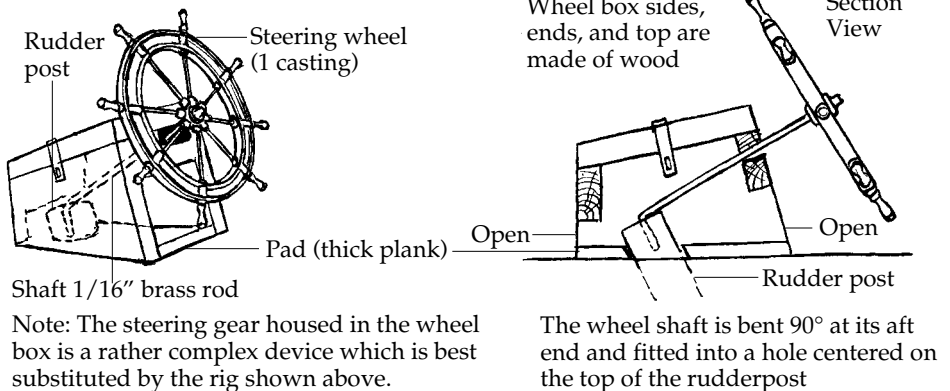
Riding bitt (wood)

Riding bitt knee (wood)

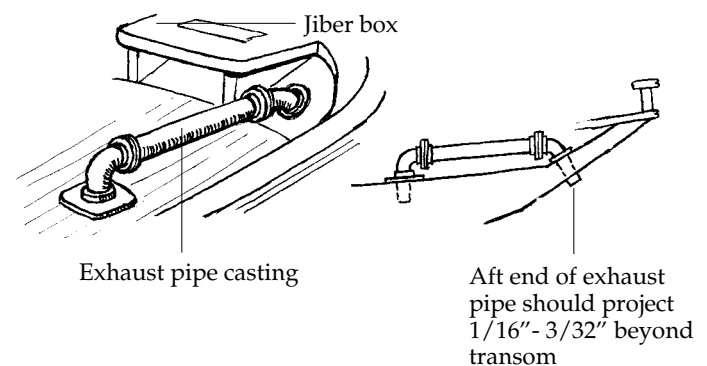
Quadrant links

Quadrants

**FIG. 37 – Wheel & Wheel Box Assembly**



**FIG. 39 – Exhaust Pipe**



## STAGE F

### MAST & SPAR CONSTRUCTION

#### 1. General Information

Carefully study the details of masts and spars which appear on all four sheets of the kit plans. Sheet 3 of 4 contains details of the hardware which must not be overlooked. Likewise, the leads and belaying points for the running rigging must be given careful attention. When you feel certain that you understand what goes where (and hopefully why), you should next take out the dowels supplied in the kit and match them to the spars of equivalent lengths and diameters as shown in the plans.

Note that virtually all spars on this vessel are tapered and that proportions of the tapers differ somewhat:

- 1) On gaffs and booms, the point of greatest diameter lies about 1/3 of the spar length from the jaws (or gooseneck).
- 2) The bowsprit's maximum diameter is at the knightheads where it passes through the vessel's bow.
- 3) Lower masts are thickest at about deck level and taper upward to the tops, where there is a more pronounced taper from crossrees to caps.
- 4) Topmasts have very little taper at the doublings where they overlap the lower masts. Above these, they taper in a fashion similar to the lower masts, but are surmounted by poles, to which the trucks and flag halyards are fastened.

#### 2. The Importance of Scale

While the scale of masts is important, the booms and gaffs are probably the most critical spars to consider in regard to proper scale. Stubby, fat-ended booms and gaffs stick out like sore thumbs, giving a model that unprofessional look. Care should be taken to assure that they are tapered properly and to correct scale.

#### 3. Tapering Masts & Spars

All spars have a parabolic (curved), not straight taper. Sighting down the spar, you would find that the sides bulge like the sides of a barrel, but in a much less distended fashion. The kit provides either round or slightly tapered birch dowels for masts and spars, but final tapering to plan dimensions is still required. A dowel is difficult to taper since it is already round. The best approach is to slice the dowel from a round shape at maximum diameter to a square shape at the ends, then to an eight-sided shape, then sixteen-sided shape. Final rounding is achieved by sanding. This approach prevents a round dowel from becoming an oval (see figure 40).

In finishing the tapered dowels, which are generally supplied too long, cut off the excess from each end so that the point of maximum diameter lies as indicated in the plans. To cut off ends, make a nick with a knife at the end mark and roll the dowel back and forth under the blade until it cuts through. It is advisable to sand the spars prior to cutting them, otherwise you may round the ends off excessively, or produce some strange taper that was never seen on any sailing vessel.

To taper a straight dowel, use a small hobby plane (see figure 35 for planing sequence). The plane blade must be very sharp and adjusted to remove only a thin curl of wood at a time. The taper of the lower masts from deck to hounds should be very slight; from 5/16" at the deck to 9/32" (1/4"+) at the cheeks,

and may be ignored by the novice, but not by the more experienced modeler. Above the crossrees, the mast heads should taper more noticeably, but the "flats," which accommodate the cheeks and trestletrees, make planing tricky. It is probably safer to file the mastheads down to size. Remember that on fishermen, mastheads are round in section, not square (see figure 41). Mark carefully where the cheeks and trestletrees are to go, and carefully file "flats" into the sides for them.

#### 4. Curved Spars

If you have been doing your homework and have been eagerly poring over photographs of fishermen in the books previously recommended, it should become readily apparent that there was hardly ever a straight spar on a Gloucester-rigged vessel.

From the day the early riggers went aboard a new vessel to "dance in her rigging and weave their spell on her," the masts would be sprung forward and the bowsprit "hogged down." All was done in the interest of keeping the stays "tight as fiddle strings," so the vessel would sail well and close to the wind. The lower masts would always be stepped and wedged with a slight 2° to 3° rake aft. The lengths of the fore and spring stays were carefully calculated to be a little short. Then, with the aid of a special tackle and a large gang pulling at the hauling end, the masts would be sprung forward, and the stays shackled to their respective straps or eyes.

A new mast would have had a very slight forward rake which became more pronounced with the change in seasons as adjustments were made to keep the stays tight. The topmasts, being of lighter stuff, were sprung more easily and required more frequent adjustment; therefore, they usually had a more pronounced forward curve than the lower masts. After two or three years, these sticks became so badly warped, they had to be replaced. The bowsprit was similarly treated, but here turnbuckles were used to get the necessary tension and resultant curvature.

Other spars such as the gaffs and booms were not induced to take unnatural shapes on purpose, but stresses caused by the sails could warp them (see figure 42). The booms were usually so heavy and poorly supported when idle, that they sagged considerably, particularly when resting on the boom crotches.

The previous information is mentioned for the sake of the perfectionists and the uninformed who may now be looking disconsolately at a warped dowel, wondering whether he should attempt to straighten it or replace it. Unless the warp is really bad, take advantage of the situation and shape the dowel so the bend will simulate the condition of the actual spar. This will spare the rigging on the model from the severe strains imposed by trying to duplicate the tense rigging of the actual vessel.

It is a source of great pride for the skilled modeler to be able to produce perfectly straight, symmetrical spars thus representing a vessel perfectly constructed and fitted out Bristol fashion. But, we are dealing with a vessel that should be fitted out in Gloucester fashion—meaning that the end results are expected to be less than perfect! By nature, the rigs of these early fishermen flirted precariously with the laws of mechanics. Principles of rigging predicated spars distorted by high tension. In other words, a working fisherman with perfectly straight spars probably never existed. So, if realism is your preference, your model should carry sprung spars. More follows on this subject.

#### 5. Lower Mast Fittings

After shaping the fore and main masts, mark the forward and aft sides at both ends where they will be easily readable. Next, mark the levels of the lower sides of the trestletrees and file "flats" for these and the cheeks on the port and starboard sides.



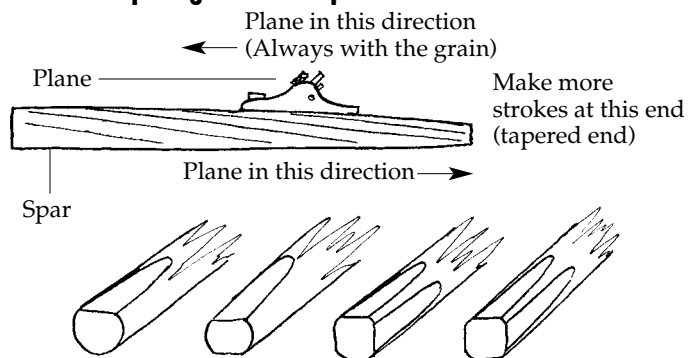
Now make and fit these members to the mast, securing them firmly with glue and pins. Allow them to dry firmly.

Meanwhile, fashion the spreaders from 1/16" x 3/32" strip-wood, tapered as directed on Sheet 4 of the plans. Make end notchings and add any prescribed eyebolts, but do not glue the spreaders to the trestletrees until the masts are ready to rig. If installed now, they will surely break.

**Bands for the halyards:** These may be added now. It was common practice with Essex-built craft to drive the halyard ring-bolts through the masts and the bands, then secure them with fore locks (see figure 43). One simple method to simulate this is to glue a strip of rag paper around the mast, drill a hole through it and the mast, and drive in a ringbolt, bending it over at the far side. When painted, the paper band can look very convincingly like metal. Metal bands can be made as shown in figure 1a.

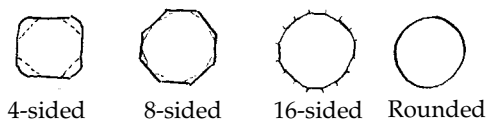
**Throat halyard cranes:** These should be fitted next. But, DO NOT GLUE the throat halyard cranes in place until after the spreaders are installed at rigging time. If you wish, make the heart irons and linkages for the throat halyard blocks, paint them, hook them to the cranes, and set these assemblies aside until they are needed (see figure 44).

**FIG. 40 – Tapering Masts & Spars**

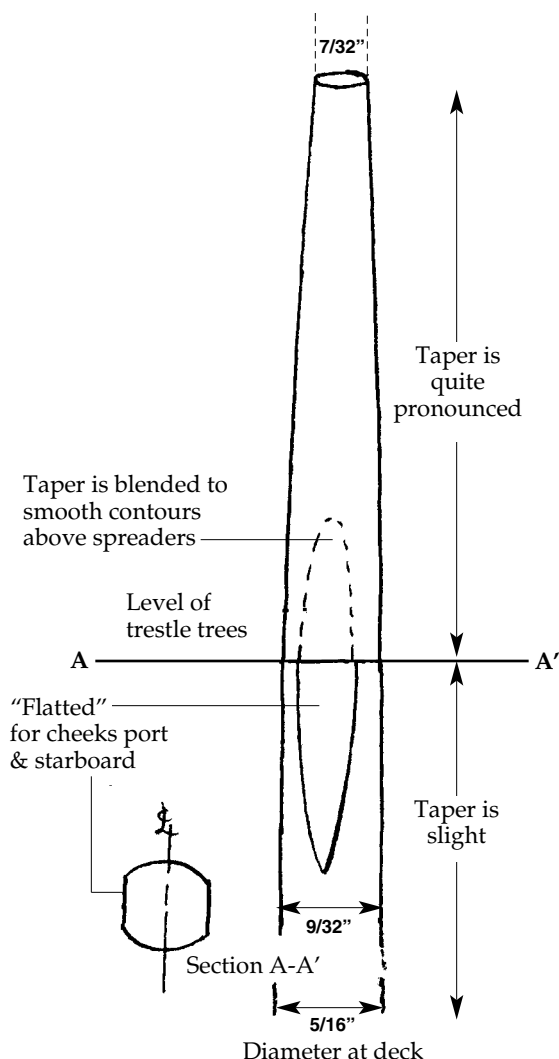


**TAPERING A DOWEL**

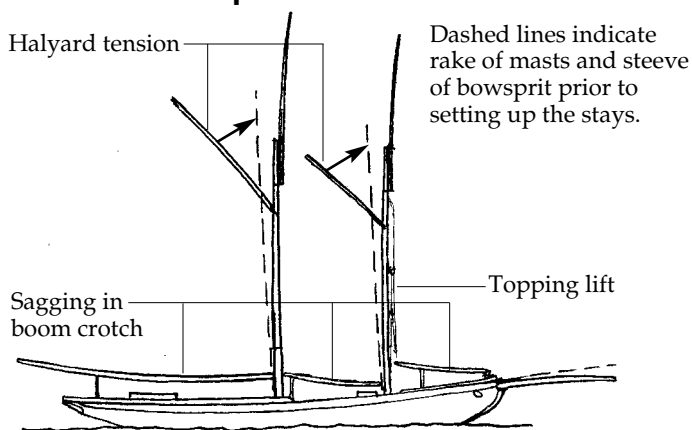
When the taper has been "4-sided", as shown above, it may then be "8-sided", "16-sided", then rounded with a file, and sanded smooth. (Dotted lines indicate wood to be removed)



**FIG. 41 – Lower Mast Head**

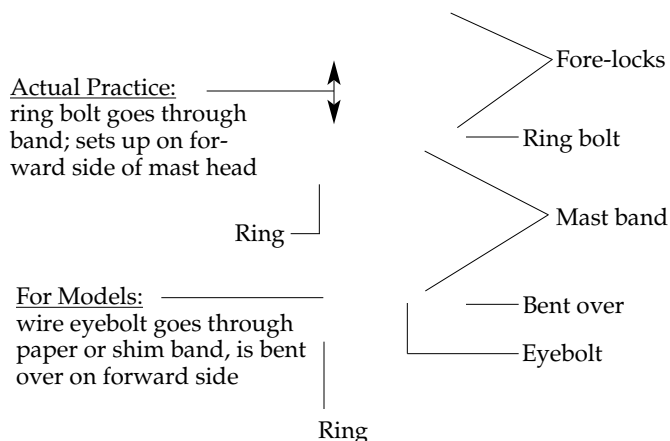


**FIG. 42 – Mast & Spar Curvature**

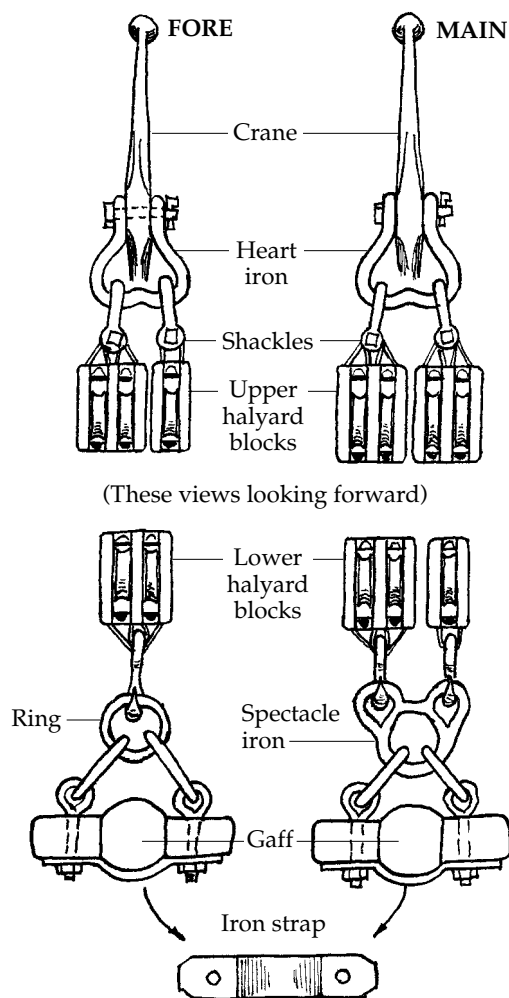


This shows with some exaggeration (but not much!) the degrees and directions of warpage of spars induced by rigging, sagging, and tension from running rigging and sails.

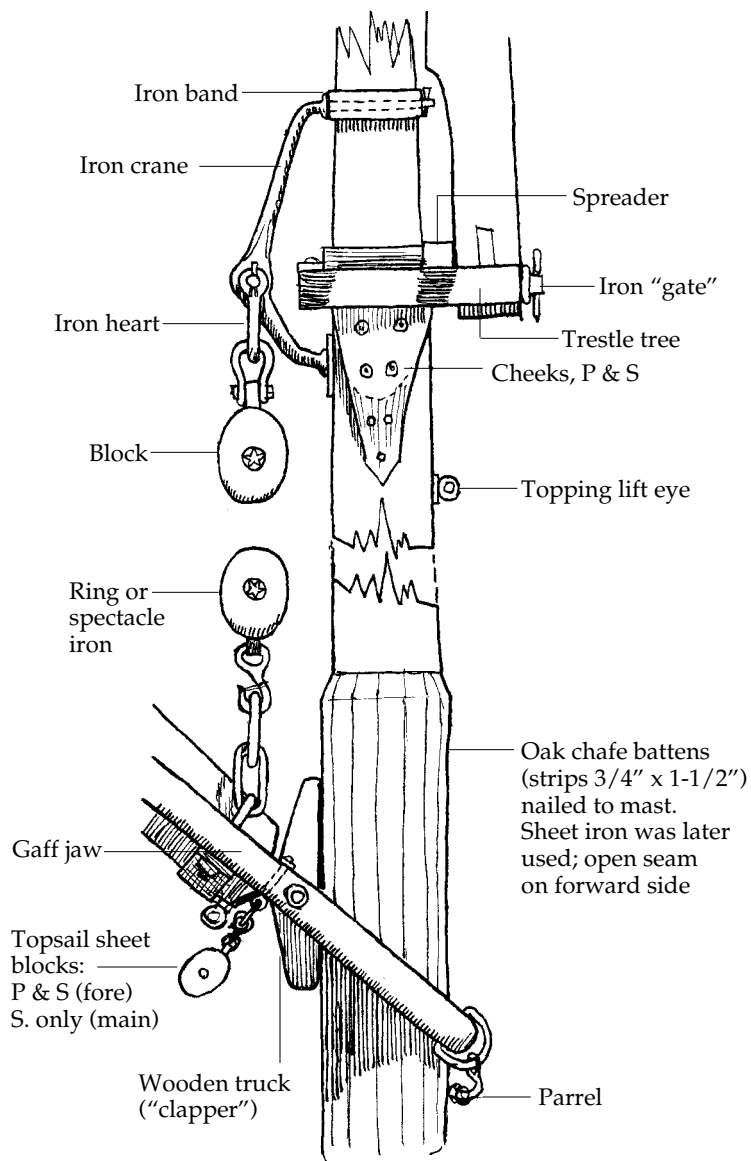
**FIG. 43 – Mast Head Bands & Eyes**



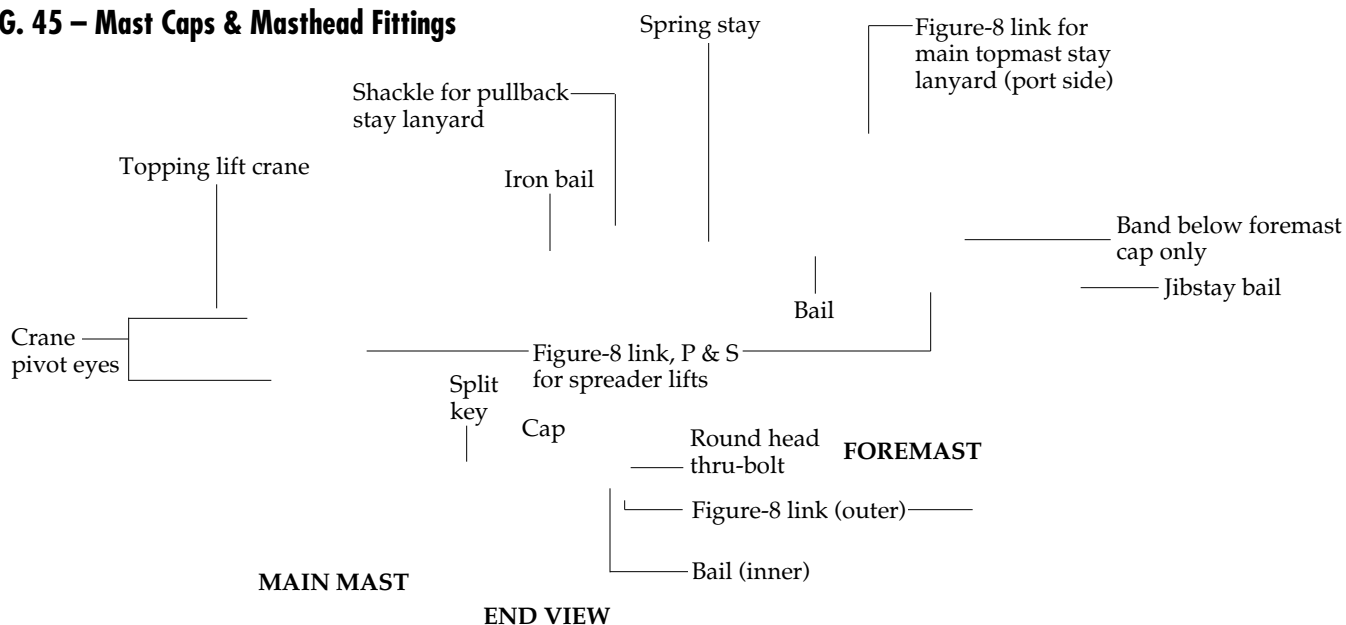
**FIG. 44 – Throat Halyard Fittings**



Note: vessels 90-120 tons carried two double blocks at the fore cranes and a triple block at the gaff jaws (fore only), but this rig may have been more than necessary for a small vessel like *Latham*, thus the above substitute



**FIG. 45 – Mast Caps & Masthead Fittings**



**Mast caps:** Originally of iron, these are supplied as metal castings in the kit. But if you prefer to make your own, it is suggested that you make them of brass strips or short lengths of tubing, soldered together. You can also drill and file them out of brass or aluminum flat stock. The caps must be drilled through to accommodate bolts and links which support the spreader lifts and also serve as pivots for the bails (supporting half hoops) used for the stays (see figure 45). In addition, an eyebolt must be fitted to the aft side of the main cap for the topping lift crane. A lower crane pivot must also be made and fitted. All of this construction must be well made. It is desirable to solder all eyes in the bails for extra strength.

**Fore mast:** The foresail boom requires that a gooseneck be fitted to the fore mast. This will allow the fore boom to clear dories, the seine boat and any other main deck clutter (see figure 46). It can be made of paper strips, pins and eyebolts in a manner similar to the peak halyard bands.

**Main mast:** This gets fitted with a wooden saddle. It is furnished as a casting in the kit, but may be substituted with a wooden piece of the modeler's own fabrication, if desired.

## 6. Topmast Fittings

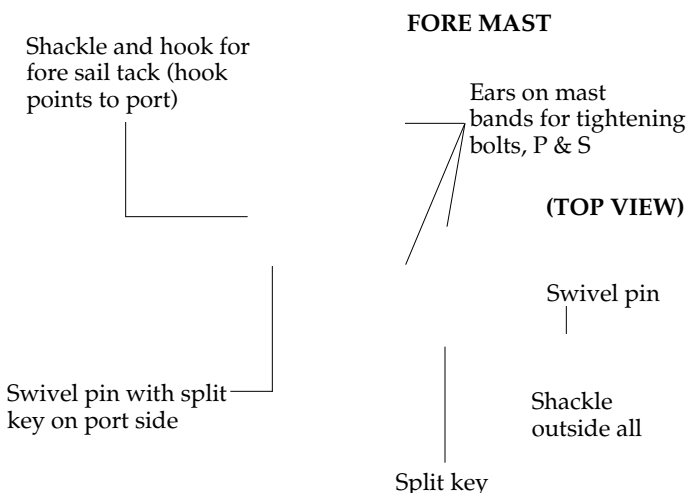
The hardware for topmasts is quite simple: one band at the foremast head; two at the main. Britannia castings are provided for these bands, but not all of the eyes on each band are needed. Snip off all those that are not called for in the plans. These may be glued down after the topmasts are in place.

**Topmast Heels:** These must be "fitted" and wedged into the trestletrees very carefully. This is a good time to make a trial fit and install the "gates" for the trestletrees at the same time (see figure 47).

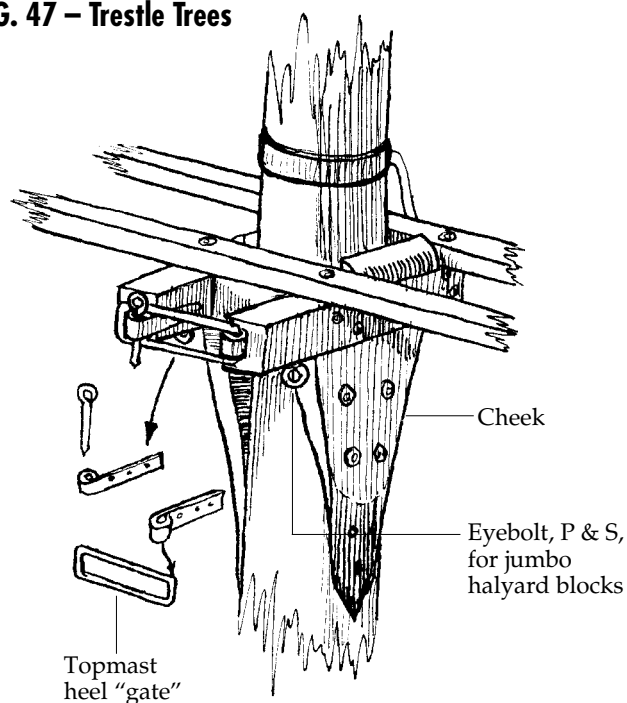
## 7. Stepping the Masts

Finish up the masts by adding any forgotten eyebolts and hardware. Fit the spreaders and throat halyard cranes. Then add the chafe collars to the lower masts (refer back to figure 44). Stain and paint these according to earlier directions. Next, slide on the mast hoops and mast coats, both of which are supplied as castings (see figure 48). The masts may now be stepped into the mast holes and wedged tight with slivers of wood which should be cut off at deck level. Add a touch of contact cement around the wedges and slide the mast coats down until they rest snugly on the deck. You may now proceed with the standing rigging or go on to the other spars. Rigging instructions begin in Stage G.

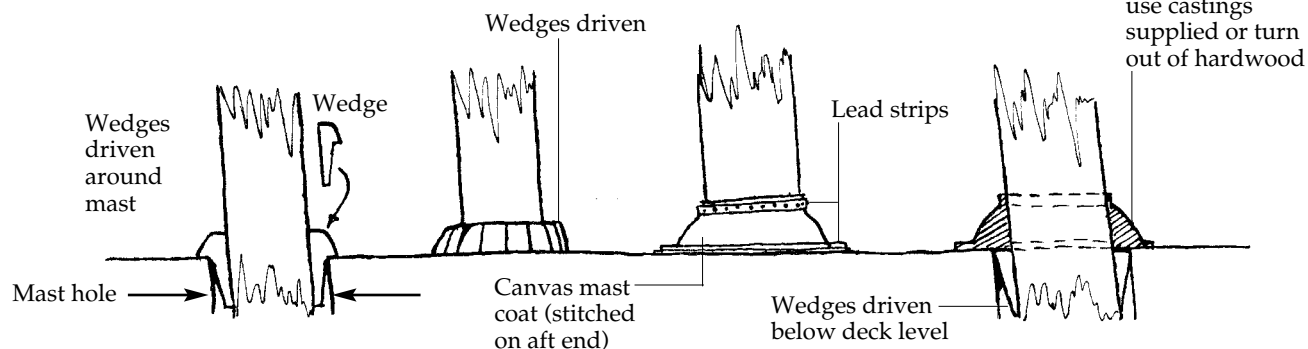
**FIG. 46 – Fore Boom Goose Neck**



**FIG. 47 – Trestle Trees**



**FIG. 48 – Mast Wedges & Coats**



## 8. Gaffs & Booms

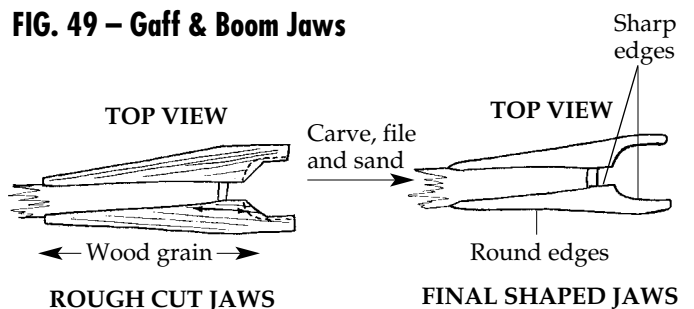
Methods of tapering and shaping these spars are the same as for the masts. But, you must adapt their lengths and the position of their fittings to suit the rigging and clear any fixed obstructions. For example, if you made an error, however slight, in spacing the fore and main masts so that the gaff and boom of the foresail strikes the main mast if swung from port to starboard, you must shorten the gaffs and booms to allow adequate clearance. Likewise, check to see if the jumbo boom will clear the fore mast when it is hauled full-back on its gooseneck.

Fittings on booms should coincide with mating deck fittings. Is the main sheet band on the boom centered over the boom jiber? Check the other booms, too! Anyone can make small errors of this nature; it happened on full-size vessels, too. But, if you do not make allowances for these little mistakes now, your errors will be compounded in later work, making them far more obvious.

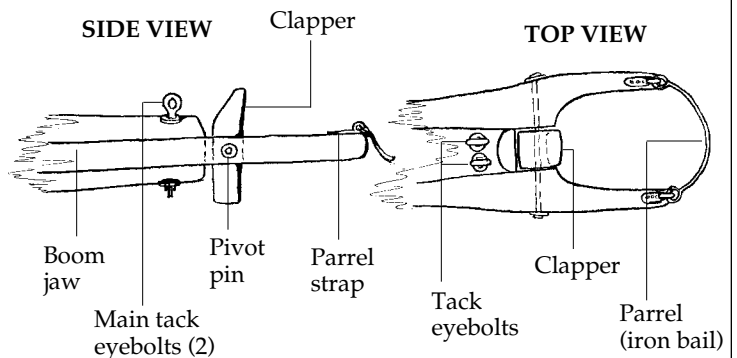
## 9. Jaws & Goosenecks

These are the most conspicuous fittings on the masts. So, they should be strongly and neatly made. Jaws may be rough-cut and glued to the spars prior to finishing touches (see figure 49). They are perhaps easiest to do on the assembled units. Small, hinged shoes, or clappers must be set in the jaws of the gaffs and main boom. The main boom clapper differs from the other two (see the plans and figure 50).

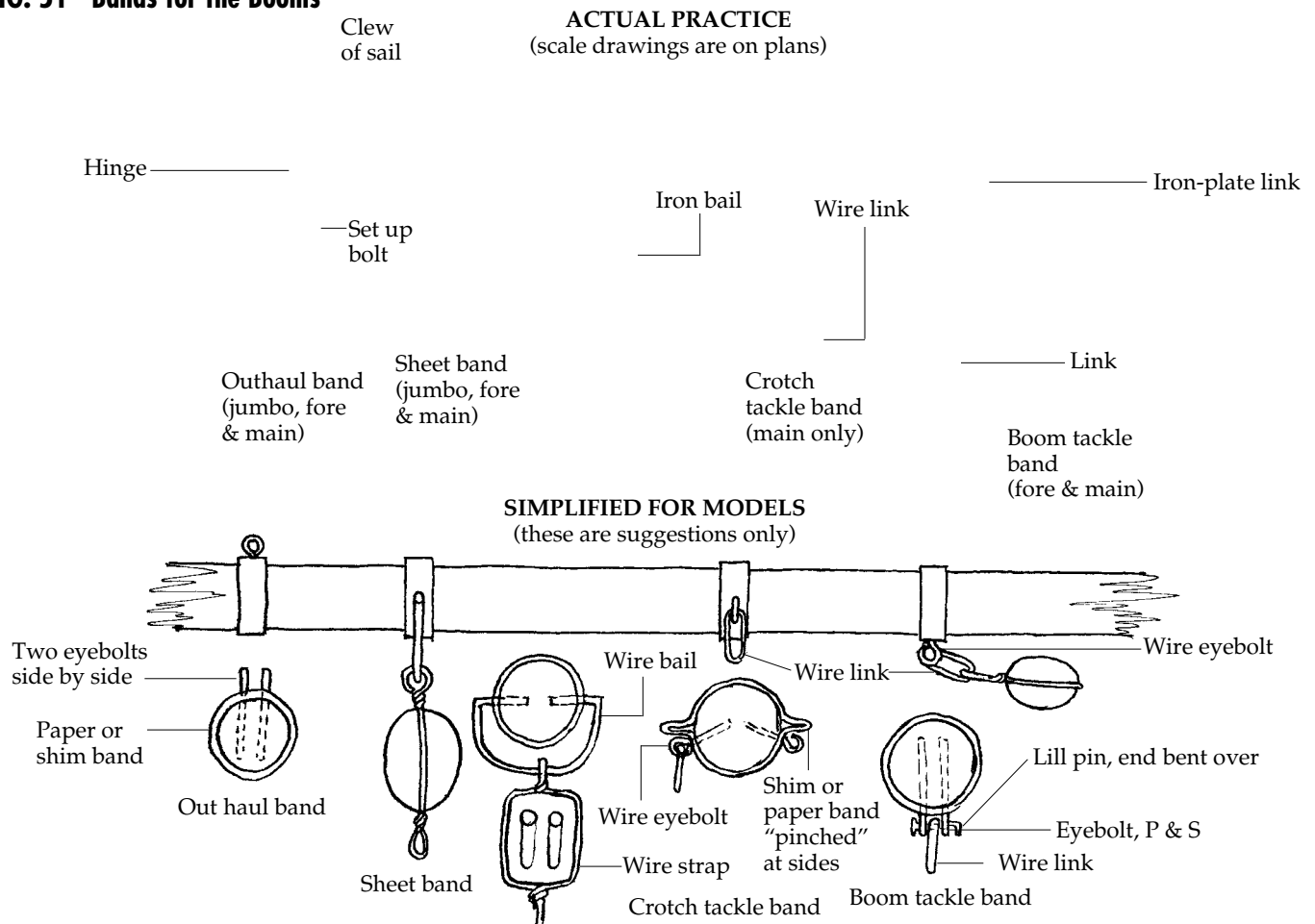
**FIG. 49 – Gaff & Boom Jaws**



**FIG. 50 – Main Boom Jaws**



**FIG. 51– Bands for the Booms**



## 10. Ironwork

Ironwork is somewhat more difficult to make for the gaffs and booms than for the masts and bowsprit. The bands are smaller, more complicated, and drilling a thin dowel for the eye-bolts and sheave holes is a tricky job at times (see figure 51 for the different types of bands required for these spars).

**Booms:** The fore boom gooseneck has been illustrated in figure 46 and the jumbo boom gooseneck appears in figure 52. If you wish to fake the ironwork with paper and wire, simplified assembly methods are shown in figure 51.

**Gaffs:** The ironwork for the gaffs is not as demanding. Throat halyard blocks and hardware have been shown in figure 44. This should be a thoroughly enjoyable project for the modeler who finds fine metalwork an interesting challenge, which it should be. The fore peak halyard blocks are fixed to bands on the gaff (see figure 53a). The main peak halyard blocks run on wire bridles which are seated in shallow grooves in the gaff (see figure 53b). These block bridles are discussed in the section on standing rigging.

The ends of the gaffs are fitted with blocks for the topsail sheets. The fore has two cheek blocks (important note: the fore topsail sheets are double!). The main has a single block shackled to a band. The main gaff also must have a band with an eye-strap for the flag halyard (see figure 54).

**Bowsprit:** There is much ironwork to be fitted for this spar which includes the bobstay irons and gammon irons (See fig-

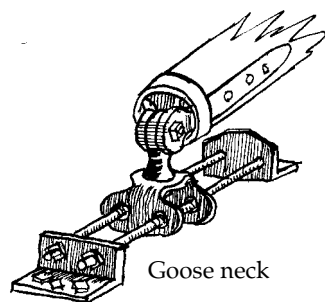
ures 55 and 57). First, fit the wooden jackstays onto both sides of the bowsprit along its upper outboard edges (see figure 56). Drill them out for the jib stops (for locations see Rigging Plan Sheet 2 and upper left corner of sheet 3. Near the end of the bowsprit is a withe (four eyes) to which the outer bobstay, the jibstay and the bowsprit guys are shackled (see figure 58). Just inside of this withe is fitted a brace band (no eyes) which supports the former by helping to distribute some of the compression loads. The brace band may be faked with paper, but the withe might be better made with metal. Or, you can use a britania metal casting provided for the purpose.

On the underside of the bowsprit, abaft the bands of the life-size *Latham* was a long plate for the inner bobstay. Passing through that plate was a heavy metal staple which formed the bobstay eye. The ends of this staple were headed over clinch rings on the upper side of the bowsprit (see figure 58). On the model, the metal plate can be simulated with heavy paper, but the eye must be very secure. Form a small staple from a common pin. Next, drill a hole in the bowsprit for it. Then drive the pin up through the hole and bend the ends over neatly.

Outboard of the bands projects the pole of the bowsprit, from which the balloon stay is shackled. This pole has a longitudinal band running its whole length, above and below, and is recessed into the wood. A strip of rag paper will represent that fitting nicely. An eyebolt can be driven through the pole and headed over underneath to accommodate the jibstay.

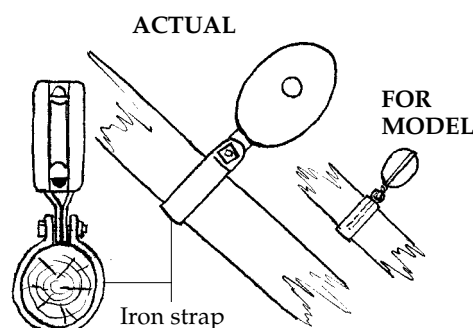
**Seine boat & net booms:** The ironwork for these is quite simple and covered in detail on the seining gear Plan Sheet 4 of 4.

**FIG. 52 – Jumbo Boom**



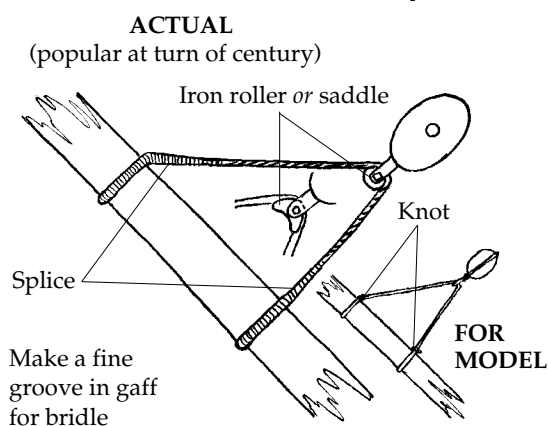
**FORWARD VIEW**

**FIG. 53a – Peak Halyard Straps & Bridles**

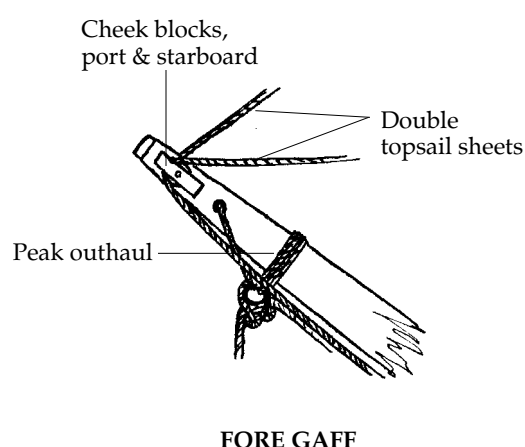
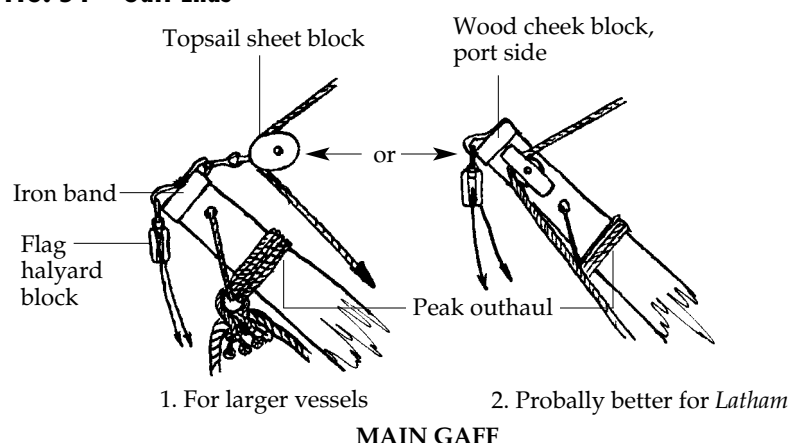


(all fore gaffs and many or most main gaffs)

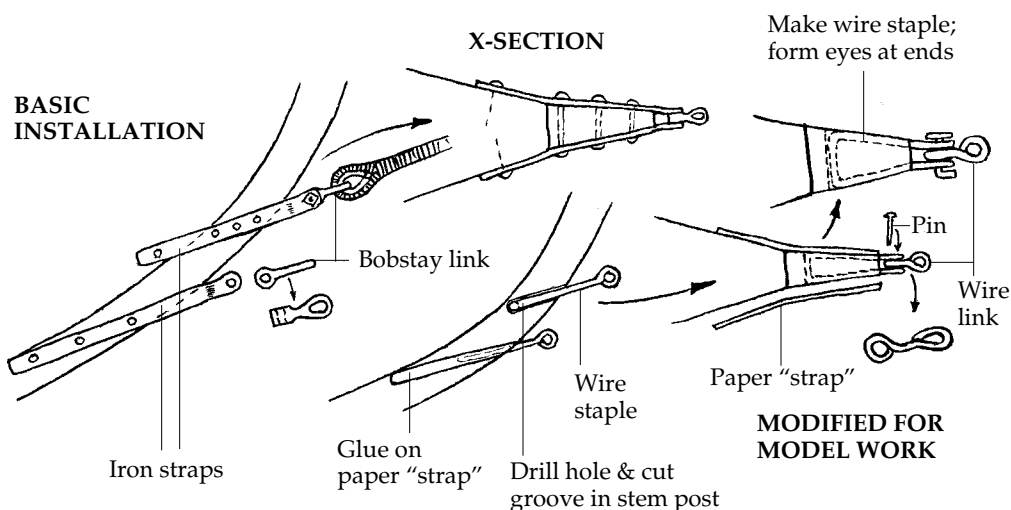
**FIG. 53b – Bridle for Main Peak Halyard Blocks**



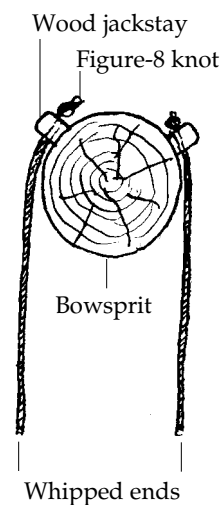
**FIG. 54 – Gaff Ends**



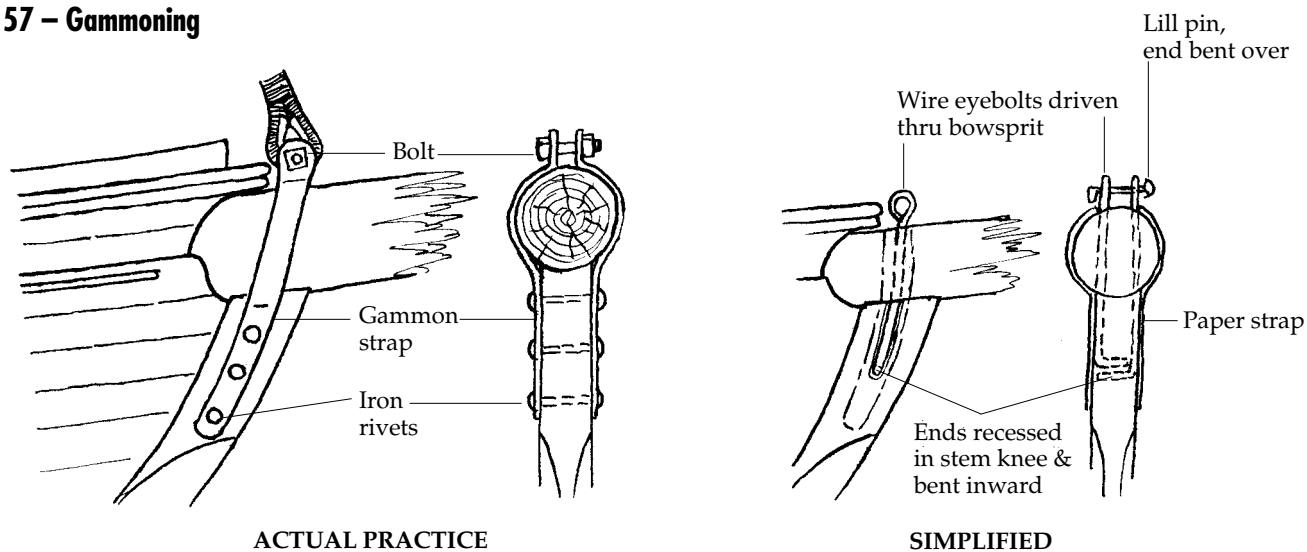
**FIG. 55 – Bobstay Irons**



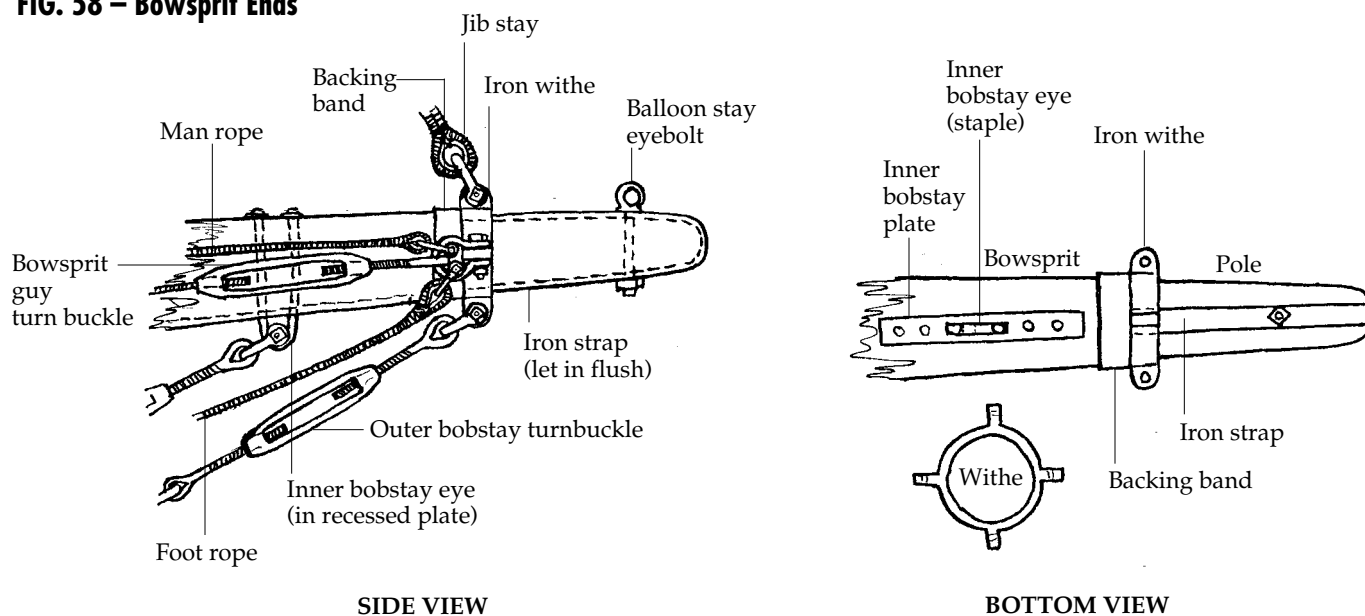
**FIG. 56 – Jib Stops**



**FIG. 57 – Gammoning**



**FIG. 58 – Bowsprit Ends**



## STAGE G

### GENERAL RIGGING & SAILMAKING INFORMATION

Rigging plans are often confusing because of the numerous lines involved, and the fact that overlapping and concealing of some of the detail occurs. Every effort, however, has been made to make the *Benjamin W. Latham* rigging procedure as clear as possible. Modelers should have little trouble, if the plans are reviewed thoroughly and the instructions are followed.

#### 1. Cordage

Standing rigging is black and running rigging is white. The nylon rigging line supplied in this kit will be adequate for most modelers. To rig as accurately as possible, however, search out and buy different line sizes to match the scale of the plans. Seasoned veterans will probably want to make substitutions, using linen, which comes in a wider variety of sizes and will last longer. Rigging diameters, block lengths and a conversion table are given on page 34.

Generally speaking, when selecting the size of thread for a given line, it is better to err on the small side. Many beautifully crafted hulls have lost their look of realism because of a heavy, clumsy-looking rigging job. Look at photographs of these fishermen and note how delicate the rigging appears, then strive to attain the same visual effect.

The use of wire for standing rigging: By *Benjamin W. Latham's* time, using wire for the standing rigging on fishermen was an accepted practice. From the visual standpoint, the diameters of shrouds, stays, etc. were considerably reduced, and not much larger, if ever, than the heaviest running rigging. Some of these lines, such as the stays, stood bare to the elements. But, a lot of them were completely covered with serving (see next paragraph) and well tarred, thus prolonging their life considerably. In addition, the eyes, ends and splices in all pieces of wire rigging were served. Shrouds, bobstays, bowsprit guys and footropes were served over their entire lengths. The main boom topping lift was served wherever chafe gear is shown in the rigging plan, then covered with baggy-wrinkle (scruffy-looking padding used on shrouds to prevent chafing).

Using real wire for standing rigging can be a tricky business. However, there is no doubt that it looks better. The results can be heartbreaking if the wrong techniques are applied to the wrong materials. First of all, avoid the tinned copper wires. These stretch, kink and never set up as tightly as you would have them do. Such wire is always subject to minute temperature changes, and what looks taut at 65° will look terrible at 70°.

There is a very fine stranded steel cable on the market advertised as control lines for model airplanes. It can be had in several sizes at hobby shops. It is suggested that any standing rigging which is all-served should be made up of linen thread, using the wire only for stays, etc. which have some of the wire exposed.

Steel wire is tough stuff to work into loops, eyes, etc., so it is best worked prior to being fitted to the model. Don't let the wire be too shiny, but work a little black or dark umber into the lay to simulate tar.

#### 2. Treating the Lines

Worming, Parcelling & Serving: Lines on ships were wormed, parcellled and served (a method of protecting parts of a rope) where they are likely to be chafed, such as the shrouds, especially at the mast heads and ends of lines fitted with thimbles. For models, worming (laying thin pieces of line (the worms) between the strands), and parcelling (winding strips of canvas saturated with tar over the part wormed) is unnecessary. Only serving (tightly binding the wormed and parcellled area in the other direction with spun yarn) of the lines is required on the model.

Serving the lines is best left to the experienced modelmaker. Beginners should not attempt it unless they are exceptionally good at detail and are able to scale down accurately.

Cordage for serving should be as fine as can be obtained. Silk, nylon, polyester and dacron are all good for the job. Avoid using cotton or linen for this work because they are too coarse and lumpy.

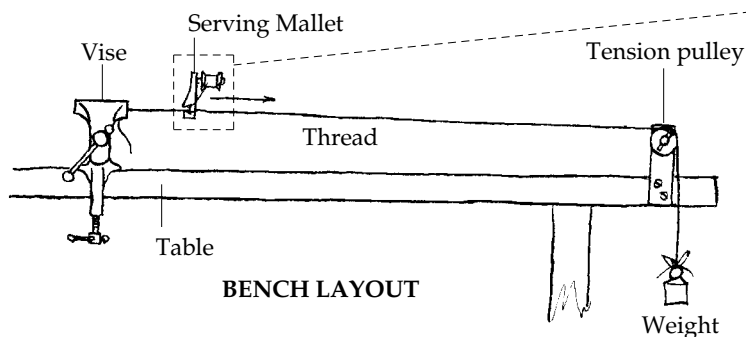
How to serve: Stretch the line between two points and use a miniature serving mallet the same way the early riggers would have done it (see figure 59). You also could secure a line between two fishing line swivels (see figure 60). Rotate the line with one hand while feeding the serving line with the other hand. Just make sure you do not stop without grabbing hold of the serving end. Otherwise, the entire thing could unravel.

#### 3. Differentiating Between the Lines

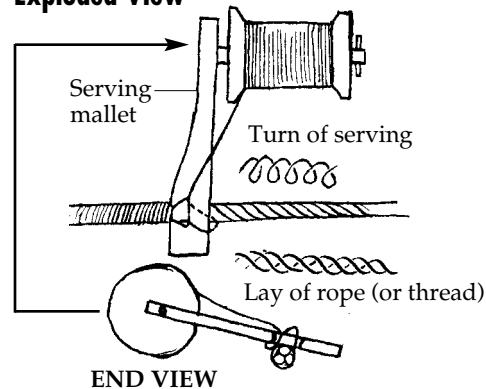
Standing rigging: Stockholm tar was the usual preservative for standing rigging on the lifesize fishermen. It was dark brown and almost black in color. If you mix burnt umber and black in equal parts, you will have about the right shade for the model.

In tinting standing rigging, it is suggested that you try thin down Model Shipways paints. Avoid a "jet black" color; even blackened tar had a slight brownish tinge to it. A little glow will not hurt either, for it accentuates the lay of the rope, or

FIG. 59 – Serving



Exploded View



serving, and imparts depth, giving it life. Some of the early riggers added turps and black paint to the tar to harden it and give it a glossy black richness which had a very handsome appearance. You can achieve this quality even with Model Shipways paints which are dead flat without additives. Just mix in a little Crystal Cote prior to painting. When dry, rub down the rigging by drawing it through your fingers. This will eliminate any fuzziness due to loose thread fibers. Or, you could use beeswax to eliminate fuzz.

**Running rigging:** This consisted mainly of manila rope for the fishermen of this period. It was a very supple-fibered cordage that ran smoothly through the blocks and was easy to handle. New manila rope was a golden straw color which tended to bleach on exposure to sun and salt water. Manila running rigging was seldom, if ever, tarred. It would rot out quickly if oiled.

The cordage supplied in the kit is too light in color so you will need to dye it. Depending on your tastes, the rigging can be tinted to resemble new stuff or old, and can vary from a rich tan to a silvery weathered gray. Linen thread from the spool will simulate bleached rigging well, but its color can be deepened to simulate new rope.

To dye the cordage, you may use any one of the commercial dyes for fabrics available from stores dealing with yard goods. Avoid dyeing the thread in tea or coffee; the tannic acids in these brews will rot out the most durable of natural fibers. Paint will stiffen thread and oil stains will rot it. Stains made by Model Shipways Paints will work. But, they must be thinned, or the line will be tinted too dark.

**Staining the lines with shoe polish:** Perhaps the best tinting for thread is liquid wax shoe polish. There are several different brands offering brown polish in varying shades and tones which can be mixed with neutral polish to obtain a lighter shade. In using these polishes, you are not only tinting the thread, but you are also coating it with a preservative which will extend its life. When dry, draw the thread through your fingers. Doing so will lay down any surface fuzz and add a mild sheen which adds life to the line's appearance.

Staining can be done before or after you've rigged the lines, and depends strongly on whether you choose to use beeswax or not.

## 4. Using Beeswax

Beeswax protects the lines against moisture and helps to eliminate fuzz. If you plan to use it, lines that need "tarring" must be stained and dried first before running over a block of beeswax. Only then should they be rigged to the model.

## 5. Sails: To-be or Not To-be

This subject is indeed a controversial one for modelers, for there are as many who will argue against putting sails on the model as there are advocates of the practice. In any case, model sailmaking is an art which is difficult to master. A modelmaker's first attempts seldom bring satisfaction. Trial and error, constant practice, triumph and heartbreak—all are attendant with this facet of ship modeling.

Working in 1/4" scale, one must first admit that no cloth may be had that will provide the proportional equivalents needed for absolute realism. This is true also of sewing and roping techniques; the effect is visual and fine tolerances are out of the question. With this in mind, you should decide whether you wish to risk the investment of time and energy on sails when the outcome is uncertain. If you do, materials are your next problem. **Choosing the right sailcloth material:** The best sailcloth for

models is Egyptian cotton spinnaker cloth, sometimes called ballooner cloth. Model Shipways carries 100% unbleached fine weave cotton muslin, which is a good substitute.

The cloth must be pre-shrunk first. Soak it in distilled water, and then let it dry, followed by very careful ironing. If the cloth you use is pure white, it may be tanned very slightly by adding brown dye to the distilled water. Tint the cloth a shade or two lighter than manila rope, please.

## 6. Making the Sails

**Laying out the patterns:** For layout work, tack the cloth down to a clean drawing board or smooth sheet of plywood. With a soft pencil, lightly mark the sail outline and the cloth seams (see figure 61a). Next, cut out the sails, leaving a uniform 1/4" margin around the marked outline (3/16" will be better, if you have very steady hands). Leave 1/2" margins on the foot and leach sides of the fore and main sails.

**Folding and Stitching:** With the aid of patience, clean hands, tweezers and a little white glue, fold the margins over so the edges touch the pencil outlines of the sails. Glue will hold this crease and permit a second folding along the pencil outline (see figure 61b). Having made the *tablings*, which is what sailmakers call hems, sew them down on a sewing machine (or by hand, if you have a lot of patience and iron fingers!). the stitches should be very fine, no more than 1/32" in spacing. When using a sewing machine, you must go very slowly to avoid running off the hem.

Next, run a line of machine stitches along the pencil lines scribed for the individual cloth panels. A double line is shown on the sail plan, indicating the selvages, or overlaps of adjacent cloths. It is not recommended to attempt a double line of fine stitches on sails this small. If you notice that the cloth is puckering around the stitches, reduce the machine's thread tension, or the sails will be a wrinkled mess when you are done, and no amount of ironing will flatten them out again.

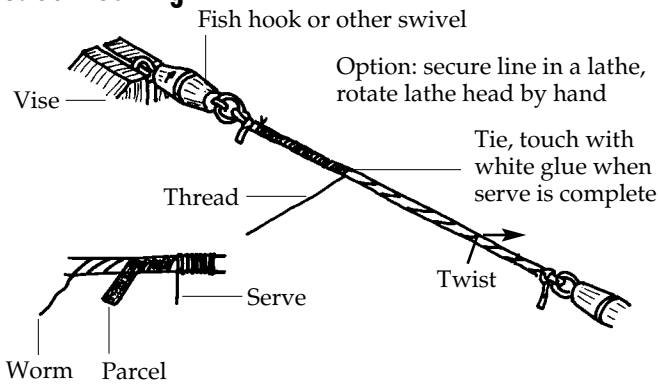
**Stretching the Sails:** This step will assure that the sail shape is correct, since it may have been altered during sewing. Using the original pattern, draw the outline of the sail's shape on a piece of paper. Place the piece of paper down on a solid, but penetrable backing, such as a wooden board or cork. Now wash the entire sail again and lay it over the outline you've just drawn. Stretching the wet sail to the outline's shape, stick pins through its outer edges and into the backing to hold it in place. When the sail is dry, it will have the proper shape. Iron it flat.

**Sewing the boltropes to the tablings:** After sewing down the cloth seams and stretching the sails, you may proceed to stitch the boltropes to the tablings. In the Gloucester sail lofts, the tablings were always sewn on the starboard side of a fore-and-aft sail; the boltropes to port. A lot of time can be saved if you sew with the sewing machine needle empty, taking the outside edge of the tabling through a "dry run." This will leave neatly spaced (1/8 to 3/16") punctures through which you can easily push a needle (see figure 62). When sewing on the boltrope, drive the needle through the roping. This will hold it in place better than stitching around it. Make loops in the boltropes at the sail corners for outhauls, tacks, throat and head cringles, reef cringles, etc.

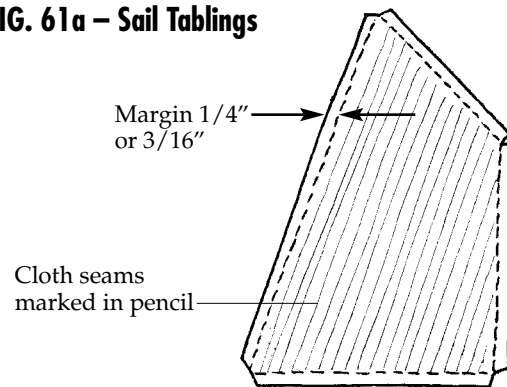
**Punching holes for reef points & other elements:** The sides of the sails which are laced to the gaffs and booms, or seized to mast hoops or staysail hanks, must be punctured at regular intervals to accommodate these elements. Check the sail plan. Also, you will want to install the reef points. Puncture the sails along the reef bands where they intersect the selvages. Next, tie an overhand knot in a short length of fine white cordage. Pass the thread through the puncture-hole until the knot fetch-



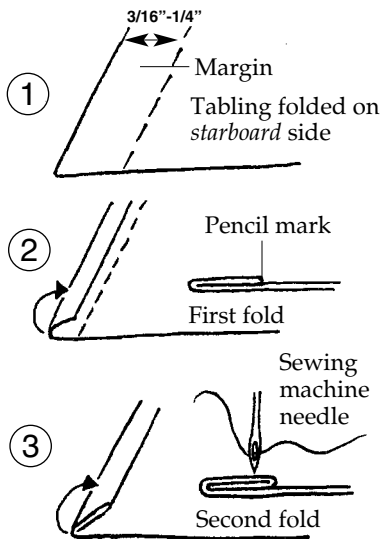
**FIG. 60 – Serving**



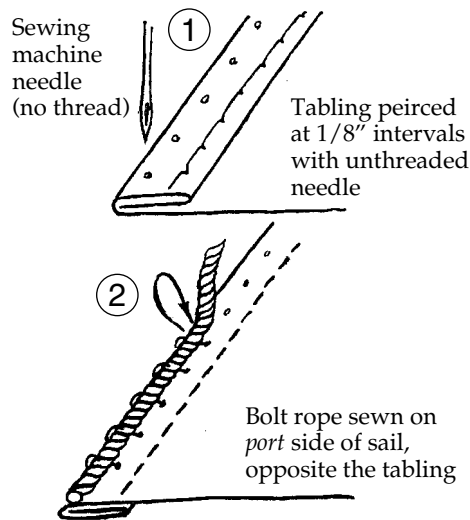
**FIG. 61a – Sail Tablings**



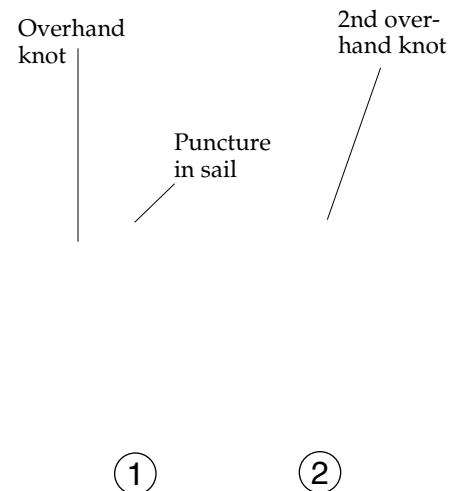
**FIG. 61b – Sail Folding Sequence**



**FIG. 62 – Roping**



**FIG. 63 – Reef Points**



es up. Then, tie another overhand knot snug to the sail so the reef point won't slip out (see figure 63). All reef points should be cut over size and trimmed back after installation.

## 7. Rigging the Model With Sails

The sails should be laced to the gaffs and booms and seized to the hoops and hanks after the halyards have been rove off, but before they are belayed. Use fine thread for hoop and hank seizings and slightly heavier cordage for the lacings.

Last to rig are the topsail clew lines used to facilitate furling (see figure 64).

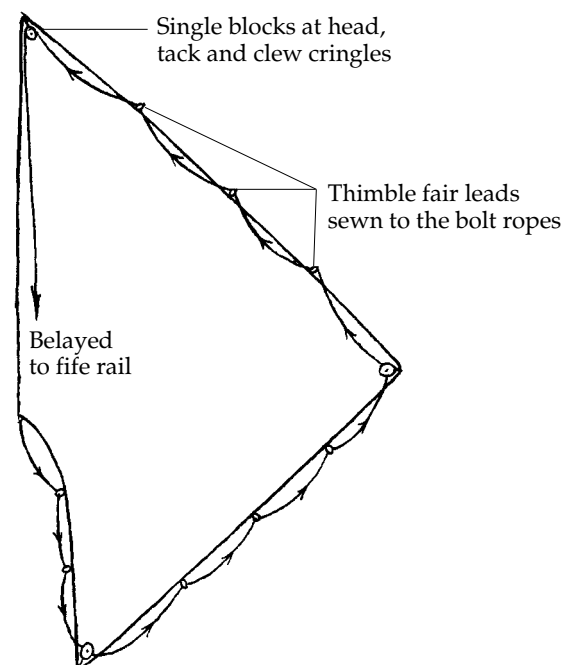
**Furled Sails:** It is impossible to furl a sail made from the same material and of the same size used for the fully set sail. The cloth is usually too bulky looking. There are two solutions to this problem: you may use a lighter material such as Silkspan, which is a model airplane covering tissue; or you may use the same cloth, cut to a proportion one-third the size of the original. You must still add some seams and hems, though, since even with the sail furled, the detailing will show.

## 8. Rigging the Model Without Sails

Even without sails, some of the rigging lines such as sheets, halyards and downhauls should remain on *Latham*, along with their lead blocks. Some of the lines will need to be hooked together, such as the jib halliards and downhauls. The running ends of these lines should be belayed at their proper locations.

Mounting the sail rigging lines on *Latham* will add tremendous-

**FIG. 64 – Topsail Clew Line**



ly to the look of the model, especially at the forward stays where the contrasting black stay and light running lines, along with their blocks, create interesting visual detail. On the plans, you will see that the belaying arrangement also indicates the inclusion of cleats or belaying pins for rigging lines such as the jib sheets and topsail tacks. And though without sails these cleats and pins are unused, they still should be fitted on the model.

## 9. Flags

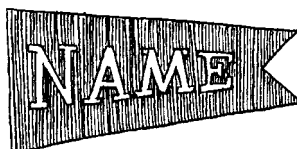
Naturally, if you set the sails, you will want to have the vessel's flags flying. If one were to follow modern flag etiquette, the Stars & Stripes should be flown from the main gaff. In the early 1900's, there were 45 stars in alternating rows of 7 and 8 stars with an 8-star row on top. Occasionally, a new vessel on her maiden trip would fly Old Glory from the main *truck* (wooden cap at the top of a pole or topmast for attaching flag or signal halyards) with a huge christening pennant bearing her name from the fore truck. Some topmast trucks, particularly the spherical style, had no halyard sheaves, so a small thimble and grommet were rigged around the poles to take the halyards. *Benjamin W. Latham's* colors are not known and colors and designs did vary a great deal. Pennants can be made from paper or fabric. Color them with paint, artist's or fabric markers. Letters can be handpainted, stenciled or applied using dry transfer letters (see figure 65 for some style suggestions).

**FIG. 65 – Name Pennants**

Length varies with length of name



Solid color border



Solid color pennant



"Barber shop" border (usually one color)

## DIAMETER CONVERSION TABLE

### RIGGING

Diameters for Lifesize Vessel	Diameters in Tenths of an Inch	Diameters Converted to 1/4" Scale
3/8"	.375"	.0209" x Inches in 10ths:
1/2"	.5"	.008" (.20mm)
5/8"	.625"	.010" (.25mm)
3/4"	.75"	.013" (.33mm)
7/8"	.875"	.016" (.40mm)
1"	1"	.018" (.45mm)
		.021" (.53mm)

### BLOCKS

Lengths for Lifesize Vessel	Lengths in Tenths of an Inch	Lengths Converted to 1/4" Scale
4"	4"	.084" (2.13mm or 1/16")
5"	5"	.104" (2.64mm or 3/32")
6"	6"	.125" (3.18mm or 1/8")
8"	8"	.167" (4.24mm or 5/32")
10"	10"	.209" (5.31mm or 3/16")

## Rigging & Block Sizes for Actual Size Vessel

(To convert sizes to 1/4" scale see Diameter Conversion Table)

### STANDING RIGGING

Item	Material	Diameter	Notes
Bobstays (2)	steel wire	7/8"	all served
Bowsprit guys	steel wire	3/4"	served ends
Footropes	iron wire	5/8"	all served
Lower shrouds	iron wire	3/4"	all served
Lower shroud lanyards	hemp or manila	7/8"	tarred
Jumbo stay	steel wire	3/4"	served ends
Jib stay	steel wire	3/4"	served ends
Spring stay	steel wire	1"	served ends
Topmast shrouds	steel wire	5/8"	served ends
Tomast shroud lanyards	hemp or manila	3/4"	tarred
Balloon stay	steel wire	1/2"	served ends
Pullback	steel wire	5/8"	served ends
Main topmast stay	steel wire	1/2"	served ends
Main boom footropes	iron wire	5/8"	all served

### RUNNING RIGGING

Item	Rope Diameter	Block Size
Jumbo halyard	3/4"	8"
Jumbo halyard whip	1/2"	5"
Jumbo topping lift pendant	1/2" steel wire	—
Jumbo topping lift fall	5/8"	6"
Jumbo boom outhaul	1/2"	5"
Jumbo sheet	5/8"	6"
Jumbo downhaul	1/2"	5"
Jib halyard	3/4"	8"
Jim halyard whip	1/2"	5"
Jib sheets	3/4"	4" bullseyes
Jib downhaul	1/2"	5"
Balloon halyard	5/8"	6"
Balloon downhaul	3/8"	4"
Balloon sheets	5/8"	—
Fore throat halyard	7/8"	10"
Fore throat halyard whip	5/8"	6"
Fore peak halyard	1"	10"
Fore peak halyard whip	3/4"	8"
Fore sheet	1"	10"
Fore topping lift pendant	1/2" steel wire	—
Fore topping lift fall	5/8"	6"
Fore boom tackle	5/8"	6"
Fore topsail halyard	5/8"	6"
Fore topsail sheets	3/4"	Cheek blocks
Fore topsail tacks	5/8"	—
Fore topsail clewline	1/2"	5"
Main throat halyard	7/8"	10"
Main throat halyard whip	5/8"	6"
Main peak halyard	1"	10"
Main peak halyard whip	3/4"	8"
Main boom crotch tackle	1/2"	5"
Main boom topping lift pendant	1-1/2"	—
Main boom crotch tackle runner	1"	10"
Main boom crotch tackle fall	5/8"	6"
Main boom tackle	3/4"	8"
Main topsail halyard	5/8"	6"
Main topsail sheet	5/8"	6"
Main topsail tacks	5/8"	—
Main topsail clewline	1/2"	5"
Staysail peak halyard	5/8"	6"
Staysail throat halyard	3/4"	8"
Staysail tack	5/8"	—
Staysail sheet	3/4"	—
Flag halyard	1/2"	4"
Dory tackle pendant	7/8"	—
Dory tackle fall	5/8"	6"
Cat stopper	1"	—

## STAGE H

### STANDING RIGGING

As mentioned in the discussion under General Rigging Information, all lines for the standing rigging should be blackened in color.

#### 1. Chainplates

These fittings are one of the foundations for the standing rigging and should be considered carefully for this reason. The chainplates for this vessel are tricky—probably the toughest job on the whole model. They can be fitted well only once; any mistakes will show badly and be almost impossible to correct without leaving tell-tale marks. Consider yourself forewarned!

**Locating the Chainplates:** First, find the precise locations of the chainplates at the rails. The forward port and starboard chainplates for the fore shrouds lay athwart the center of the fore mast at the deck. This applies to the forward main shroud chainplates, too (see figure 66 and the rigging plans). Mark these positions with a pencil, then measure and mark the positions of the chainplates which lay abaft their respective leaders. See the rigging and deck plans for spacing intervals and transfer these spacings carefully using a pair of dividers.

There are three lower shrouds on both sides of each mast. The chainplates of each group should be evenly spaced. Equally spaced between the second and third chainplates of each triplet lays a fourth and smaller chainplate for the topmast shrouds. Be sure that all of these positions are marked *clearly* and *exactly*.

**Achieving the Proper Angle:** Each chainplate should be mounted at an angle relative to the rake of the mast. First, step the masts so they stand nearly vertical (see the rigging plan, and for the moment, disregard the previous sermon on sprung masts). Take a length of cordage and loop and tie it at a point on the mast where the shrouds will eventually be placed. Then extend the line of cordage down to the rail where a chainplate should be fitted (see figure 67). Pull the cord to the waterline, holding it taut, and strike a line from the reference mark at the rail to the lowest limit of the chainplate. Such a line should be created for each chainplate in order to determine its proper individual angle.

**Making the Chainplates:** Included in the kit are sixteen prefabricated chainplates that will allow for a simplified installation (see Figure 68). This method requires a minimum of tools and is recommended for the beginner. Normally, the chainplate is recessed into the hull planking with its upper end “buried” in the cap rail, as will be described in the next paragraph. But, if you adopt the simplified installation, you will be able to forego these maneuvers.

For those interested in building precisely detailed Essex chainplates, one method is shown in figure 69. If the kit chainplates displease you, the eyes may be cut off and smaller holes drilled along the length of each piece. The widths of these pieces are actually just right for the four topmast shroud chainplates. The twelve lower shroud chainplates require that you buy three #985 brass strips measuring .017" x 1/16" x 6." You will find them in the Model Expo catalog.

FIG. 66 – Locating the Chainplates

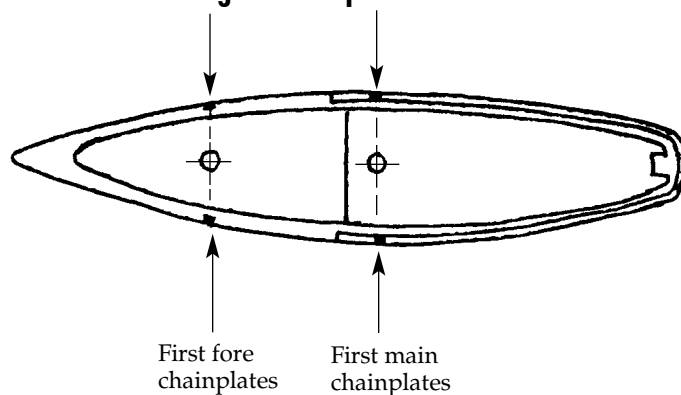


FIG. 67 – Achieving the Proper Angle

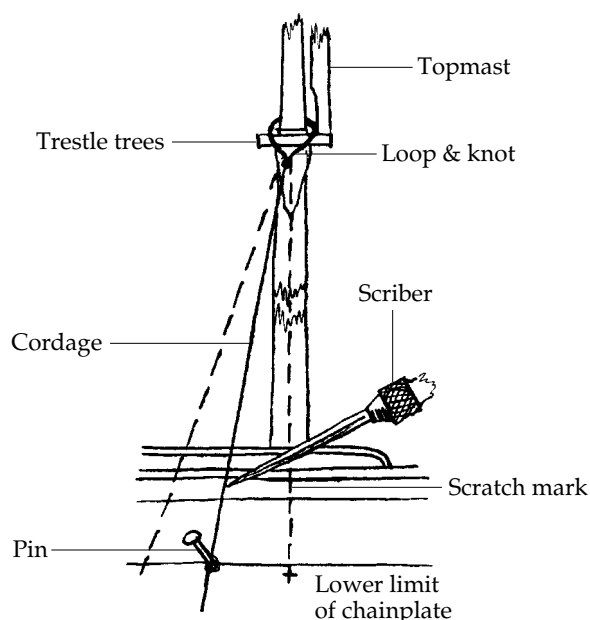
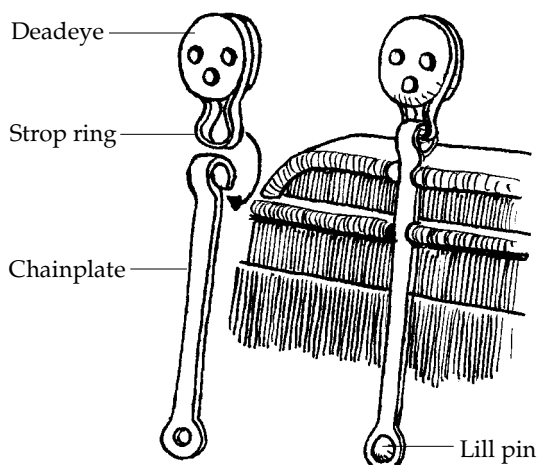
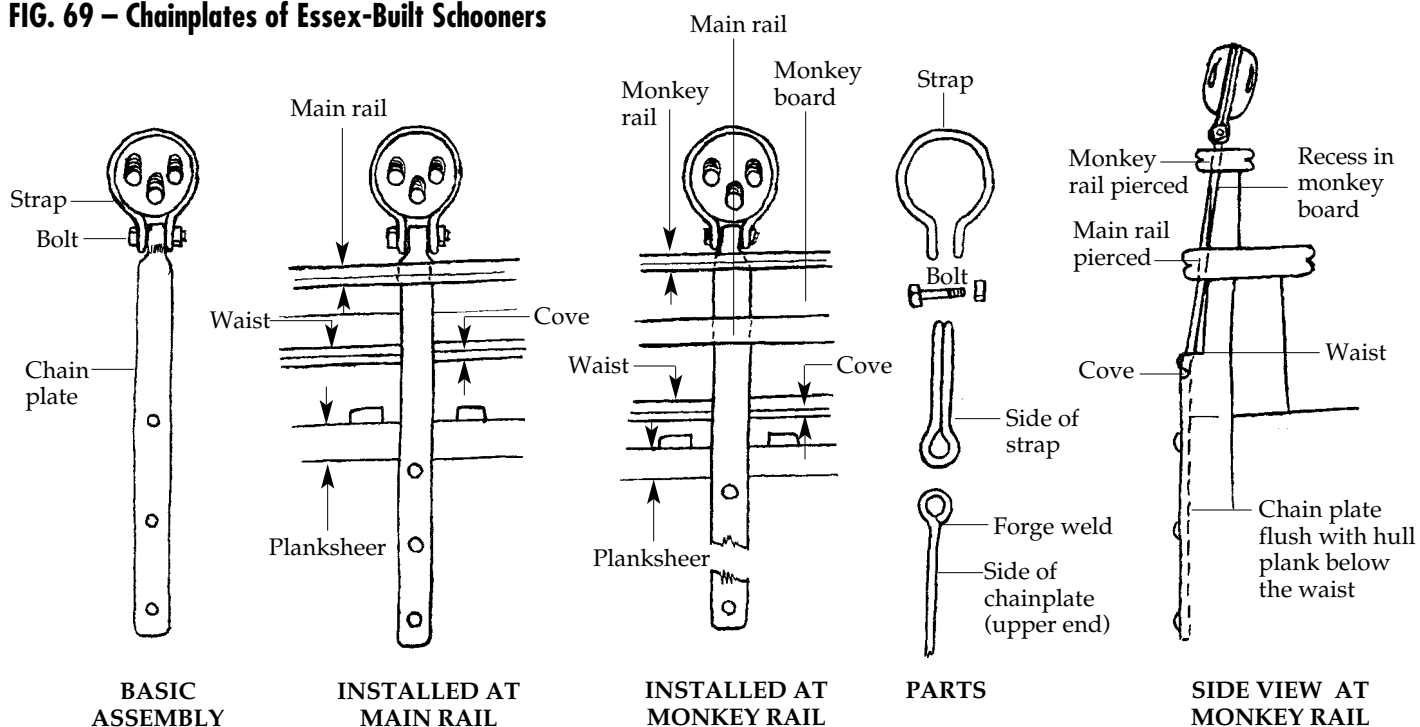


FIG. 68 – Simplified Chainplates

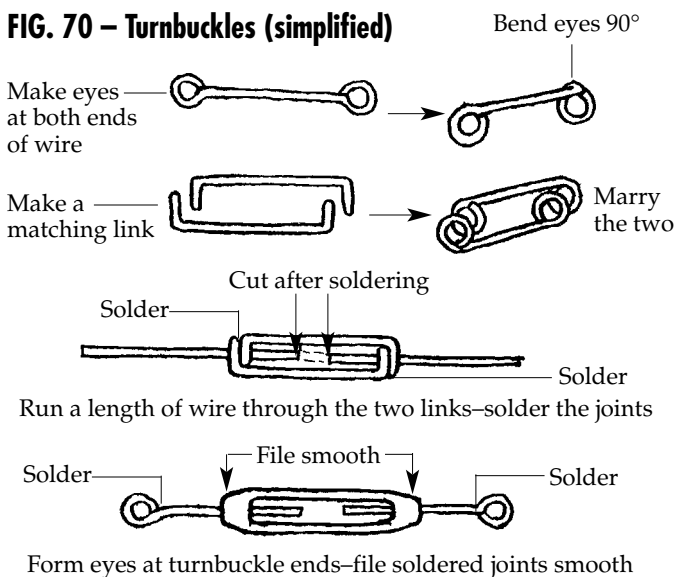
#### FOR LOWER SHROUDS



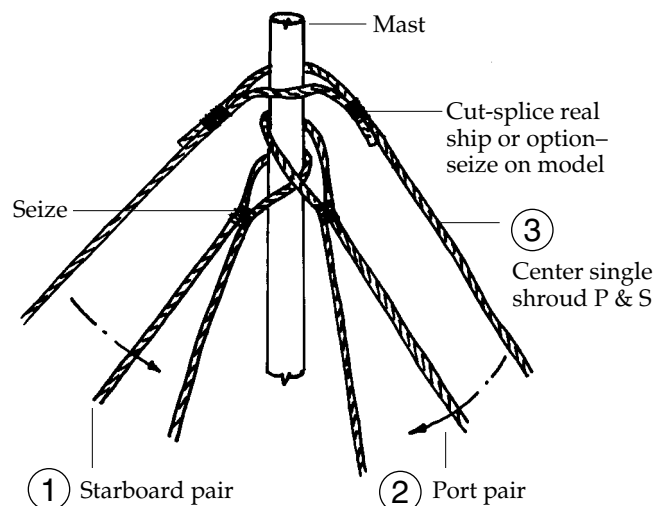
**FIG. 69 – Chainplates of Essex-Built Schooners**



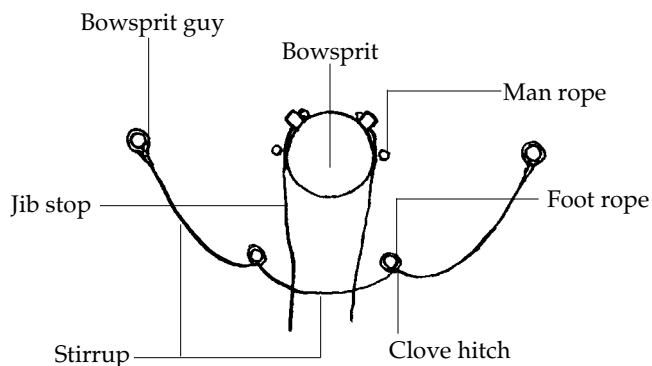
**FIG. 70 – Turnbuckles (simplified)**



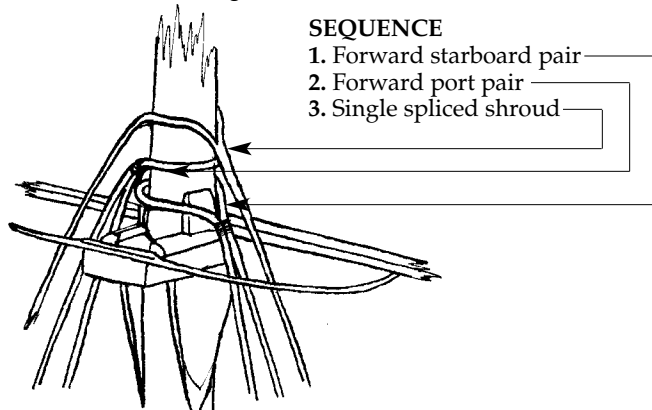
**FIG. 72a – Shroud Sequence**



**FIG. 71 – Bowsprit Rigging Cross-Section**



**FIG. 72b – Seating the Shrouds**



If done properly, the chainplates should be recessed into the hull so they are flush with the hull planking. Their heads should poke up *through* the rails (see figure 69). This will entail some fancy drilling and cutting, not to mention giving your layout work very careful attention. Nails for fastening the plates in true-scale fashion are no longer available. So, using a No. 75 bit, drill the chainplates to accept lill pins. Hold the pins in place on the hull and drive them in with a driver tool. If you prefer smaller heads on the pins, they may be filed smaller and flatter, using a pin vise to hold them during the process.

## 2. Rigging the Bowsprit

**Inner & Outer Bobstays:** Make and set up the inner and outer bobstays (see plan sheets 2 & 4). These should be served over their whole length. The lower ends should be eyespliced and shackled into the bobstay irons. The upper ends should be eyespliced, shackled to turnbuckles and set up taut. The lower ends of the bobstays on the lifesize vessel were often given an extra heavy serving. In addition, the outer received a covering of rawhide or heavy leather called a stradden, which was laced on the topside of the stay. This was done to prevent chafing from the ground tackle while lying at anchor. Many operators of mackerel schooners engaged in summer work dispensed with the heavy bobstay coverings.

**Bowsprit Guys:** Next to be fitted are the bowsprit guys. They should be spliced and served in similar fashion to the bobstays, minus the stradden. Instead, give them an extra heavy service, from their inboard ends out to a point abreast of the gammoning.

## 3. Turnbuckles

If the modelmaker wants to adjust the forward stay rigging, he can purchase four #700 working turnbuckles which will do the job well, at slight sacrifice in scale appearance. Otherwise, dummy turnbuckles can be fabricated with wire and solder (see figure 70).

## 4. Footropes & Manropes

These are finer secondary elements of the bowsprit rigging. They also should be served overall, but rigged very slack as shown on the rigging plan. The bowsprit guys and footropes should be linked together by tarred manila "stirrups" which should be done similar to ratlines (see figure 71).

## 5. Fore & Main Shrouds

**Pairing & Seating of Shroud Lines:** Shroud lines must be put on before the stays and before the topmasts can be fitted. Each mast will have a 3-line shroud unit on both its sides, port and starboard. Each of the lines will extend from the mast heads to the chainplates (see plans). You may work on one or both masts at the same time. Begin with the first pair of shroud lines at starboard and then the second pair at port (see figures 72a). Each pair is comprised of a single length of cordage that should be doubled over and seized together to form a loop that will fit loosely around each mast head (see figure 72b). When you have finished these four pairs, they must be served. Follow the serving procedure for the shroud "pairs" in the discussion on serving that follows before going on to the last of the shroud lines.

After serving the shroud pairs, you may begin the "single" shroud line that should be positioned in between the lines of each finished pair. To create this "single" center shroud line you will need two lengths of cordage for joining at each mast head. One end of each of these two lengths should be wrapped around the mast head to meet the other. Draw just enough excess length, so that you can cut-splice them together (see also

figure 72a). This joining will form a single continuous line that you can extend downward at both port and starboard in between each of the two pairs of both masts. Follow the serving procedure in the next paragraph.

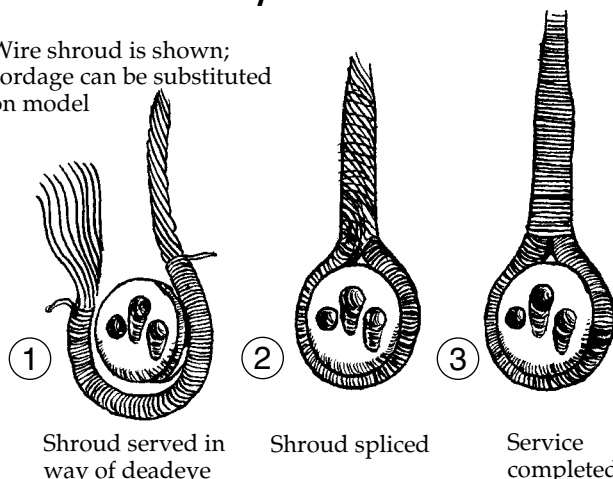
**Serving the Shroud Lines:** The shroud "pairs" should be served over their entire lengths. They require additional heavy servings around the eyes at the chainplates, which on the life-size vessel were covered with canvas and well tarred. The extra serving will look well on the model, but canvas is tricky to simulate and is probably best omitted.

Follow the same serving practice on the shroud "singles" as described in the previous paragraph, but in this case, the heavy service extends below the levels of the gaff jaws if the fore and main sails are to be set. The extra service was done on the life-size vessel to prevent the gaffs from chafing the shrouds.

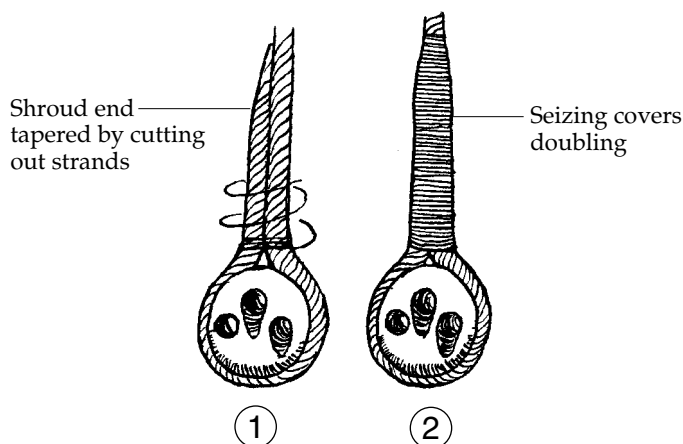
**Shroud Line Deadeyes:** The lower ends of the shroud lines were, in actual practice, spliced around the deadeyes. Each shroud end should be first served where the deadeye should be fitted. An eyesplice then should be made and covered with serving in the same fashion as was done on the main lengths of the shroud lines. The deadeye splice may be substituted with a very neat job of seizing and tapering of the shroud end along its doubling, followed by serving (see figure 73).

FIG. 73 – Shroud Deadeyes

Wire shroud is shown;  
cordage can be substituted  
on model



### ACTUAL PRACTICE



### SIMPLIFIED FOR MODELS

Setting Up the Deadeyes: Generally, the upper deadeyes should be set up to the shrouds so they line up parallel with the main rail (see figure 74). To set up each shroud line, first tie a stop knot in the lanyard of each deadeye. A Matthew Walker knot is most proper, but in this scale, a figure-eight knot makes a neat substitute. Next, reeve off the lanyards (see figure 75). You will need to finish them off in a lark's head knot at the shroud lines and seize the lanyard end to its last leg, BUT before making the lark's head, make the sheer poles and seize them to the shrouds (see figure 76).

## 6. Belaying Pin Racks

Following installation of the sheer poles and the setting up of the deadeyes, the pin racks should be cut out, stained, and their belaying pins installed. Seize the racks between the lanyards (see also figure 76).

## 7. Ratlines

These may be rigged as soon as all four shroud line units are set up. Or, if you prefer, you may do them after the fore and main lower standing rigging is finished. There are various ways to do this job. They can be sewn in place, glued on, or hitched to the shrouds as in actual practice. Hitching is the most tedious method, but it always looks the best when done carefully and honestly (see figure 77). Whatever method you prefer, use the finest thread available. Assuming that the real ratlines had a diameter of 3/8," a .008" diameter thread should do the job on the model at 1/4" scale. It is possible to find silk and some synthetics to this degree of fineness.

Draw A Ratline Diagram: Proper spacing and levelness of ratlines are vital to achieving a pleasing appearance. To aid you in your work, draw fine rulings for spacing the ratlines on an index card. Place the card with the finished diagram between the shroud lines and mast, parallel to the waterline. Your taking the time to create this guide will make the work easier to see and do. If your ratlines resemble a spider's handiwork rather than that of clumsy fingers when you are finished, then you've achieved the right effect!

## 8. Lantern Boards

These should be fabricated from wood with wooden lantern brackets built out to seat the kerosene lanterns (see figure 78). The boards should be inserted into iron holders that are seized to the shroud lines. If at the time you rig them, you find that the topmast shroud lines rub against the lantern brackets, you may rig a strut below each board to eliminate chafing.

## 9. Spring Stay

This stay is eyespliced and served at both ends with bare wire in between (see figure 79). Doing the former requires removal of the masthead bails so they can be passed through the eyes. Simple seizings covered with serving are perhaps a better alternative.

## 10. Jumbo Stay

First make the bridle that goes around the fore masthead and over the spreader (see figure 80). This bridle should have its ends eyespliced and should be served over its whole length. It can be made of wire, but thread will be more manageable. The head of the jumbo stay should be eyespliced, served and shackled to the bridle ends. It can be made of wire which should be bare over most of its length, except for the addition of rigging tar. The lower end should be served, doubled over, and seized with wire to form an eye which gets bolted into the gammon strap. In the case of the actual vessel, fitting the

jumbo stay and its bridle was not so simple a matter. As you may recall from earlier reading, the masts were raked aft slightly and sprung forward, making the procedure difficult.

For the Curious: On the actual vessel, riggers and available hands went forward to assist the boss rigger during this dangerous job. After a gin tackle was hitched to the stay, the lower end was made fast to the bowsprit. The windlass gang pumped the hauling end and the hauling gang pulled down and bolted the stayeye to the gammon strap. If it slipped or broke, the poor soul who handled the gin-tackle would be thrown from the masthead as from a slingshot—and how these fishermen loved to have their stays tight!

## 11. Jib Stay

This stay should be spliced and served at its upper end and shackled to an iron bail at the fore mast cap (see also figure 80). The lower end should be served, doubled over and seized, then shackled to the iron withe at the end of the bowsprit. There should be a lot of tension on the jib stay, but not quite as much as on the jumbo stay. Do not slacken the latter when setting up the former.

## 12. Spreader Lifts

These short wire lengths support the spreaders at points where they must bear the strains of the dory tackles and the trappings of the masthead men and lookouts. On each side, the wire should be served at about its center, doubled over to form an eye, and then seized and shackled to a figure-eight link at the cap (see details on plan sheet 3). The lower ends should be eyespliced around thimbles, served, and then set up to eyebolts in the spreaders with lanyards.

## 13. Fore & Main Topmast Shrouds

These are single wire leads on each side of the topmasts (see plan sheet 2). They should be cut-spliced to each other, served and then seated over the topmasts. The lower ends should be served and spliced around deadeyes, as in the lower shrouds, and set up with lanyards in like fashion. The topmast shroud lanyards should pass outboard of the sheer poles and should not be involved in any way with these or the pin racks. The shroud wire should be bare, except for the ends and the short span that passes through the spreader tips.

## 14. Main Topmast Stay

Eye-splice and serve the upper end and seat it snugly around the main topmast head, over the topmast shrouds. Terminate the lower end in a small eye that is spliced and served. Reeve a lanyard between the eye and a figure-eight link on the port side of the fore mast cap. Set up the line, springing the main topmast forward (see rigging plan sheet 2).

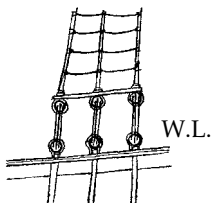
## 15. Pullback Stay

The ends and fittings are identical to the main topmast stay, but this is somewhat shorter, as can be measured from the rigging plan. It should be set up with a lanyard to a shackle in the aft eye of the spring stay. Apply only enough tension to keep the stay from kinking; the forward rake of the fore topmast must not be affected.

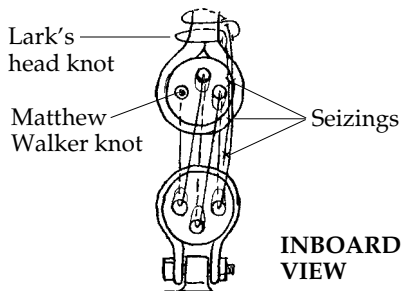
## 16. Main Boom Footropes

Located both port and starboard, each footrope should be eyespliced at both ends and served over its whole length. The aft ends should be shackled to ringbolts at the end of the boom on both sides. Shackle the forward ends into the set-up bolts in the main sheet band (see rigging plan sheet 2).

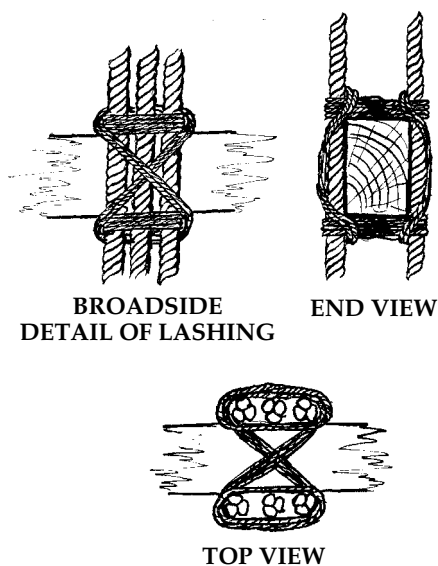
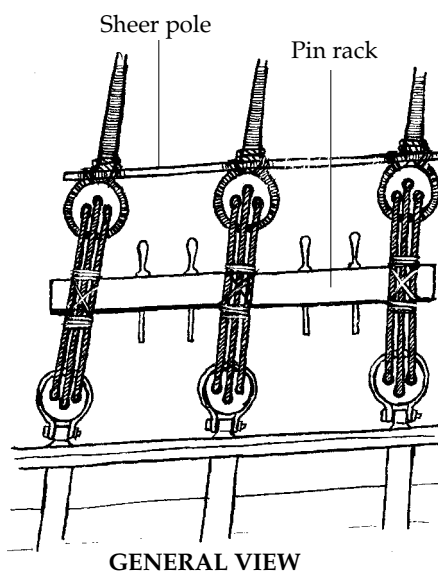
**FIG. 74 – Line-up of Deadeyes**



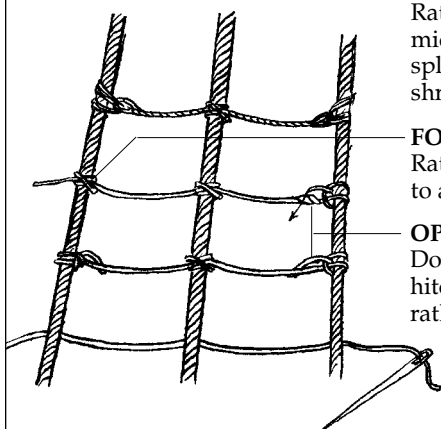
**FIG. 75 – Deadeye Lanyards**



**FIG. 76 – Pin Rack Details**



**FIG. 77 – Ratlines**



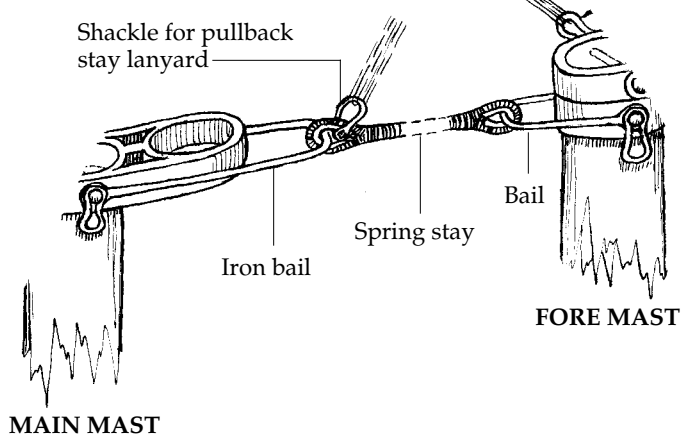
**ACTUAL PRACTICE**  
Ratlines clove-hitched at middle shroud ends; eye spliced, and seized to end shrouds with marline

**FOR MODELS**  
Ratlines clove-hitched to all shrouds

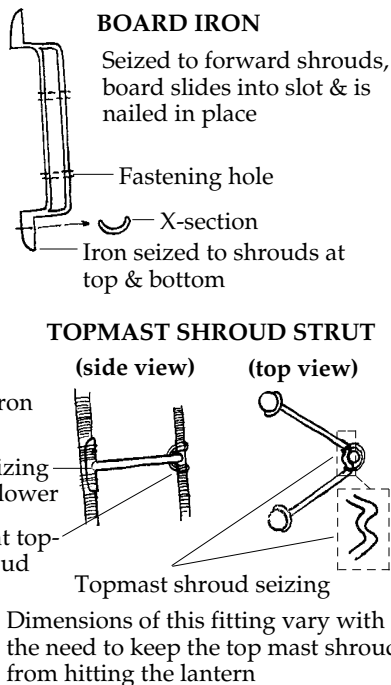
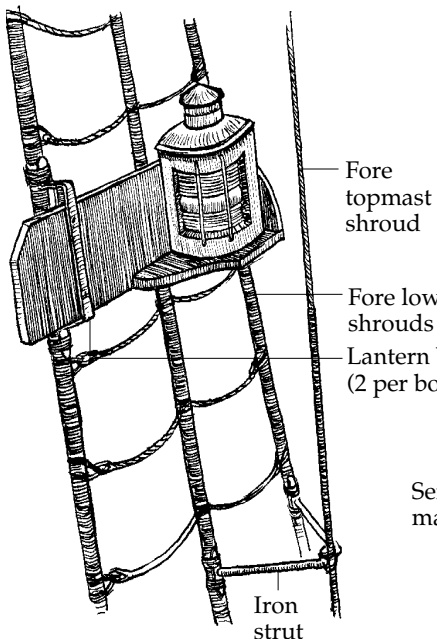
**OPTION**  
Double back the tail-ends after hitching and tuck them into the ratline. Glue and trim neatly

Faked ratlines can be "sewn" thru the shrouds. Touch ends with glue

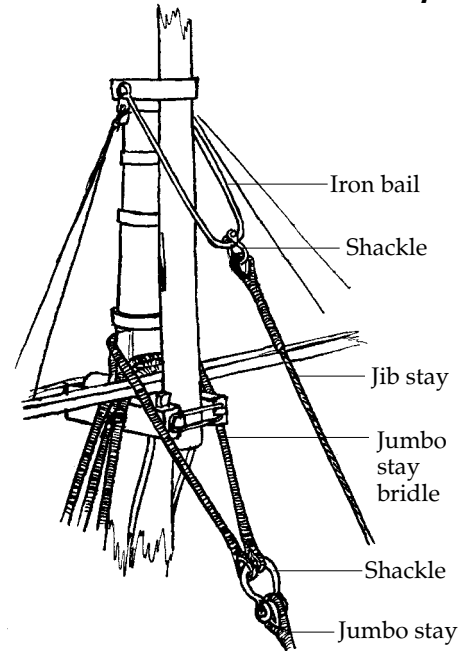
**FIG. 79 – Spring Stay at Mast Caps**



**FIG. 78 – Lantern Boards**



**FIG. 80 – Heads of Jib & Jumbo Stays**



## STAGE I

### RUNNING RIGGING

The running rigging lines are all beige in color. If you are going to apply beeswax to the lines, it is best to do it before rigging them. Especially in the case of the standing ends of running lines and those attached to blocks. Again, it is important to think about procedures well in advance of installing any parts.

**Where to Begin:** If you plan to rig your model with sails, they should be made now and bent to the rigging and spars as pertinent running rigging is rove off. A discussion of sailmaking is in Stage G, item five. If you haven't read that section yet, do so now.

Before you start the running rigging, all blocks must be hooked or shackled to their appropriate bands on the spars or designated hull fittings. Bridles and pendants also must be rigged where indicated.

### 1. Blocks

Boxwood blocks are supplied in the kit and should be allocated according to the plans. You may want to make some smaller blocks to get even closer to scale as possible. Clean the blocks a bit by reaming out the sheave holes and filing out the grooves for the sheaves and strops (or straps). Then strop them (see figure 81). Note from the plans and sketches that most fisherman blocks of this period were internally stropped. To follow such practice on the model would mean resorting to actual block-making techniques in miniature. Only advanced modelmakers should attempt to do this. Your safest bet is to fit external strops as snugly in the strop grooves as possible, then carefully file the sides of the blocks so they blend with the strops. Paint all blocks just as they were on the working fishermen. Use either white or buff to match the booms and gaffs.

### 2. Jumbo, Fore & Main Boom Rigging

Study the rigging plan carefully and observe the leads and belaying points of boom tackles, topping lifts, sheets and crotch tackles (see also figures 82 and 83). Start with the topping lifts and get them set up so the booms "peak" at about the angles shown on the plans. Fit the fore and jumbo booms to their goosenecks, the main boom to its saddle, and rig the main boom parrel strap.

**Fore & Main Boom Tackles:** Rig these next and belay them as directed (see plans and refer to figure 51). The Sheets can now be made fast to the block becket and rove off and belayed (see the plans and figures 84 and 85). Unless the model is to be rigged with sails, the booms should be sheeted home snug. Figure 84 shows the proper rigging of the crotch tackles as they would be if the sails were furled or omitted. The figure also demonstrates how the tackle would be properly stowed away if the vessel was under sail (unless the vessel was jogging under reduced sail).

### 3. Fore & Main Gaff Rigging

**Throat Halyard Blocks:** By now, these blocks should have been hooked into the crane irons (refer to figure 44). Bolt the fore peak halyard blocks to their bands on the gaffs. Run the gaff blocks of the main peak halyard on wire bridles whose ends have been spliced around the gaff and served. Keep the rest of the wire bare. All masthead blocks for the peak halyards should be hooked to their respective ringbolts.

FIG. 81 – Stropping the Blocks

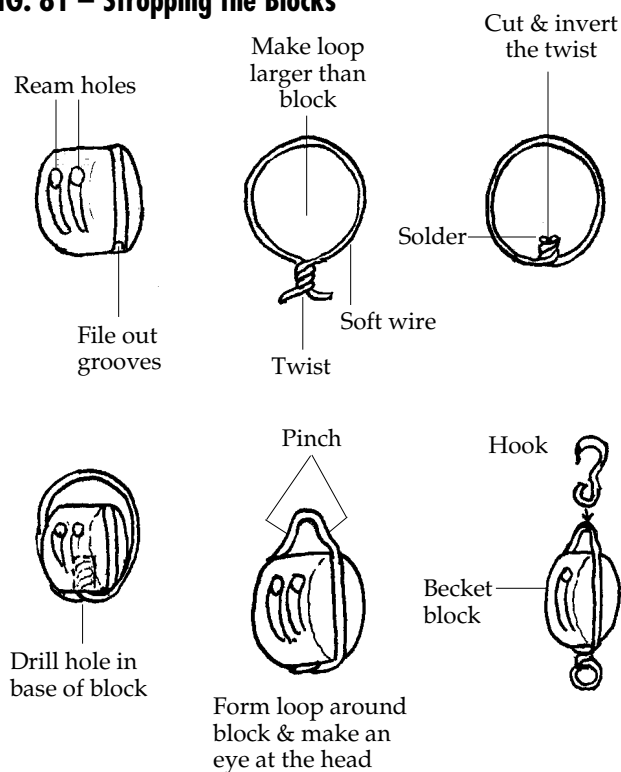
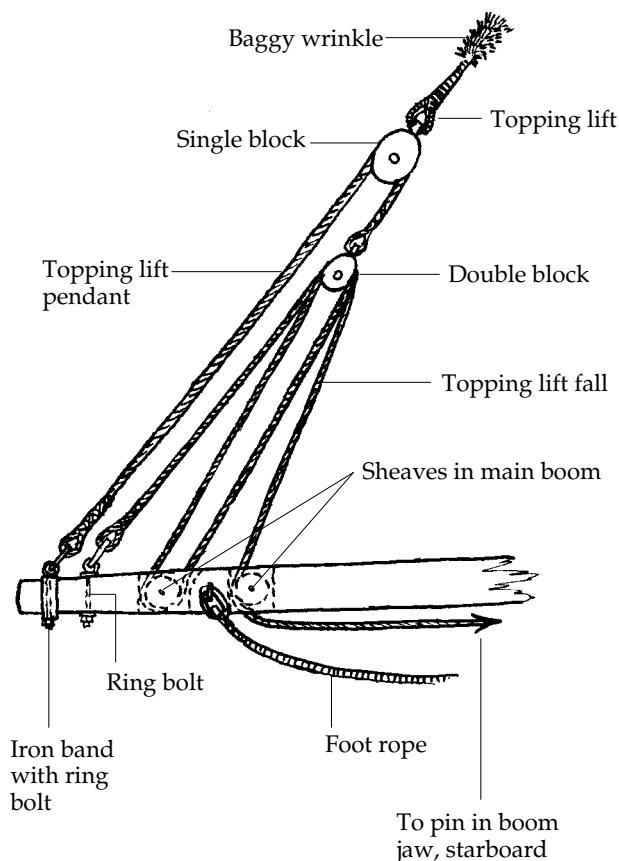
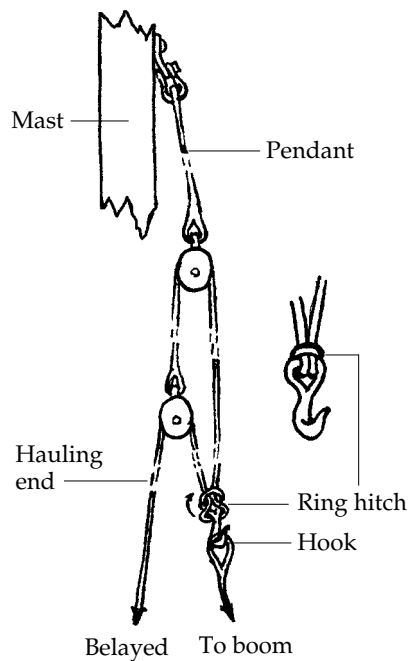


FIG. 82 – Main Boom Topping Lift

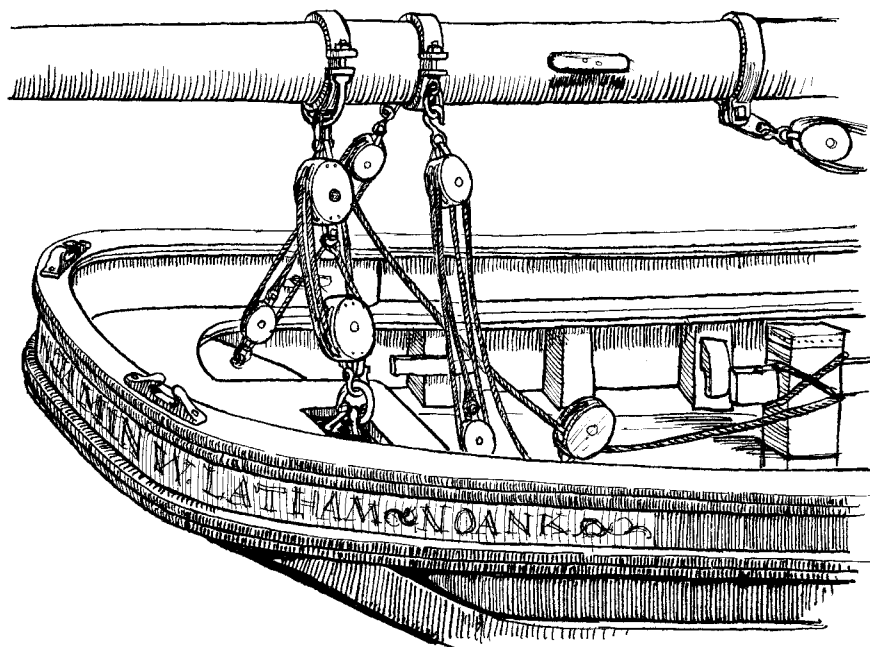




**FIG. 83 – Fore & Jumbo Boom Tackles**

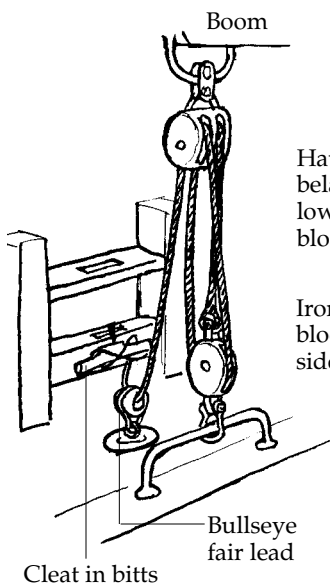


**FIG. 84 – Main Sheet & Crotch Tackle**

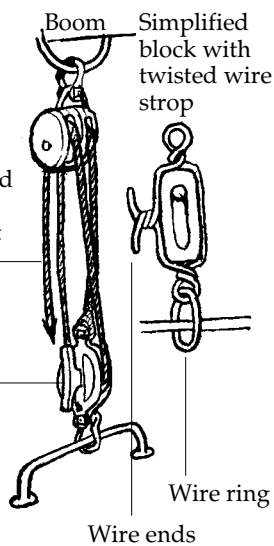


**FIG. 85 – Fore & Jumbo Sheets**

**FORE SHEET**  
(and later jumbo sheet)

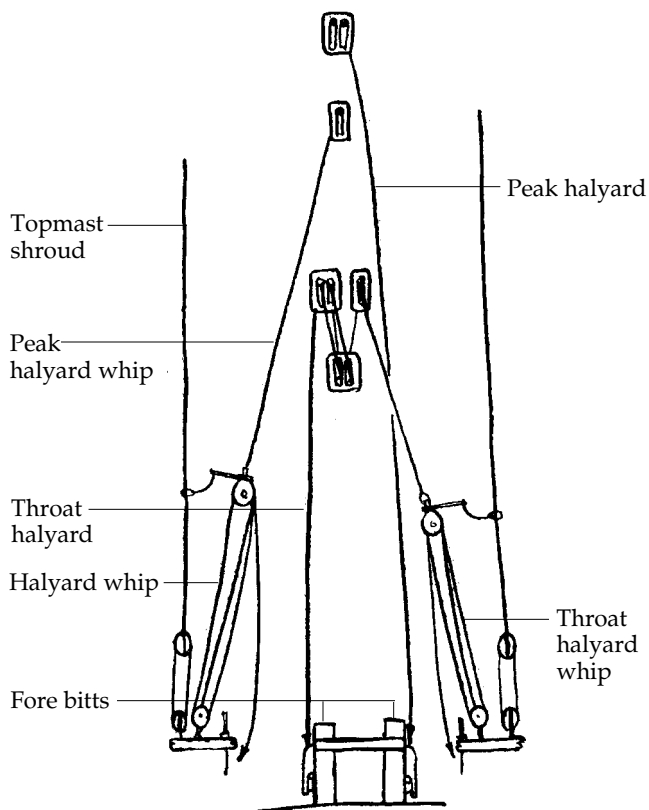


**JUMBO SHEET**  
(pre-1910)



**FIG. 86a – Throat & Peak Halyards**

(Gaffs and masts omitted for clarity)



(Looking forward)

**FORE MAST**

**Peak & Throat Halyards:** These halyards can be hauled from both of their ends. The *hauling ends* are used to lift the gaffs up. The *whip ends* are used to make final adjustments in the set of the gaffs (see figures 86a and 86b). These ends alternate. This means that the throat halyard whip will be opposite the peak halyard whip, and the throat and peak hauling ends will be opposite each other. Note the *gill-guys* (wooden poles) that are rigged to the upper whip blocks and run to the topmast shrouds (see figure 86c). They prevent the whip falls from twisting and fouling. Note the small halyard fairleaders mounted to the iron spreader struts; the hauling ends of throat and peak halyards are passed through these in their travels to the fife rails (see the masthead details on sheet 4).

It should be anticipated that some topsail gear will lead to the gaffs. Precise leads are described in a later paragraph. There is also a flag halyard to rig from the peak of the main gaff (refer to figure 54). Don't forget to rig the parrels (wire) and trucks (glass beads) to the gaff jaws (refer to figure 44).

## 4. Head Sail Rigging

Even if you don't rig sails, perhaps you ought to rig all of the halyards, sheets and downhauls for the jumbo, jib and balloon to show evidence of their existence, if nothing more. In actuality, when sails were taken off the vessel, all downhauls, the jib and balloon sheets, and the balloon tack line would have been unrigged, too. But, to do this on the model would leave it looking rather bare. It is your choice, so rig it accordingly.

**Jumbo & Jib Halyards:** These should be rigged with hauling and whip ends, but they are simpler than those of the gaff halyards (see figure 87). As can be seen, gill-guys are not needed for the whips. If you're not going to show sails, hook the halyard blocks to the tack hooks at the stay-eyes, or hook them to the downhauls, if the latter are rigged.

**Balloon Halyard:** This halyard is much simpler and requires little additional explanation (see rigging plan sheet 2). It may be hooked to the tack line when in lowered position without sails.

**Jib Sheet:** Run this line through bullseyes spliced into the ends of a served wire sheet pendant. On the real vessel, the standing end of the sheet was spliced to a bullseye mounted atop the buffalo chock, but it can be seized on the model. Next, it should be rove through the sheet pendant, and aft to another bullseye fairlead mounted *inside* the buffalo chock, then on to a cleat in the bulwarks (see hull and rigging plans).

**Balloon Sheet:** This line consists of single leads, port and starboard, which should be hooked to the clew of the sail and led aft to adjustable fairlead thimbles which should be rigged to the main topmast shrouds. From the leaders, they should be taken to belaying pins in the main rail (see figure 88). With the sails omitted, the jib and balloon sheets may still be rigged by hooking their clew-ends into the hooks of the lower halyard blocks. In addition, the jumbo sheet leader should be lowered to main rail level.

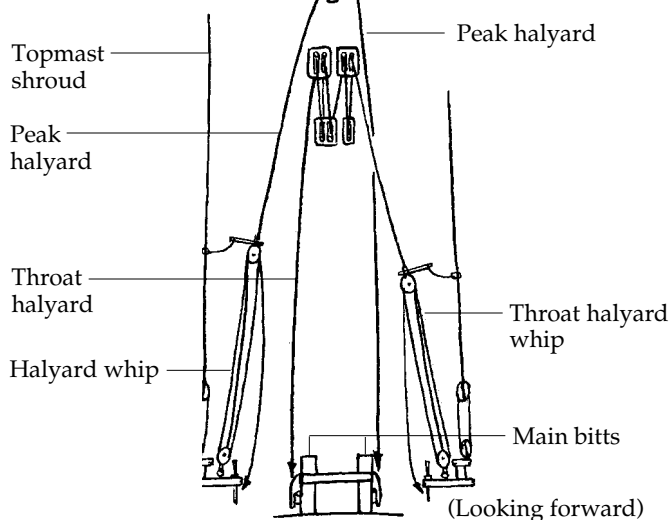
## 5. Fore & Main Topsail Rigging

**Topsail Halyards:** These are very simple lines (see the rigging plans). The topsail sheets should be led out to blocks at the gaff-ends, and down through lead blocks at the gaff jaws, then on to their belaying points (refer to figures 54 and 44, respectively). The rigging of the fore topsail sheet is rather more complicated than this and requires a double lead. On the real ship, it was a necessity to allow getting the topsail over the spring stay and main topmast stay when tacking the line. Under sail, the lee sheet was taken up. The weather sheet was slack and led up over the main topmast stay and down to the weather cheek block at the head of the gaff.

**Main Topsail Tack:** This is a single lead which should be hooked into the tack of the main topsail and led down to a pin in the fife rail on the port side. The fore topsail tack again should have two leads. Make the weather tack taut and the lee slack. The weather tack is for hauling the foot of the topsail over the gaff. It should be taken down to the fife rail and belayed. The lee tack should be led up from the foot of the sail, then over the spring and main topmast stays from the lee side. Next, take it down the weather side of the stays and the fore peak halyard, then over the gaff, and down the lee side of the fore sail to the fife rail (see figure 89).

**FIG. 86b – Main Mast**

(Gaffs and masts omitted for clarity)



If you plan to exclude sails, the topsail sheets and tacks may be omitted. For the sake of visual interest, however, the sheets may be rigged. Hook their clew-ends to the topsail halyard blocks, and then hook the halyard blocks to the mast caps.

## 6. Staysail Rigging

Because the staysail on *Benjamin W. Latham* had both peak and throat halyards, it had to be lowered to deck when tacking, and then reset on the opposite legs of the same double halyards. This, of course, differed from the staysail halyards of the later "racing" fishermen which had only to dip their staysails under their springstays to reset them on the opposite tack.

The peak halyard was actually an endless rig, so there were no bitter ends to come loose. The lee part of the halyard was hooked to the head of the sail and hoisted aloft by hauling on the weather part which was then belayed to the main rail (see figure 90).

The throat halyard was a single lead with hooks at each end; the lee hook went into the throat cringle of the staysail which was sent aloft by hauling on the weather part of the halyard. In tacking, the sail was lowered to the deck and the halyard ends switched duties.

When idle, both ends of the peak halyard were hooked to the sheer poles, the slack taken to a belaying pin; and both ends of the throat halyard were taken to their respective belaying points.

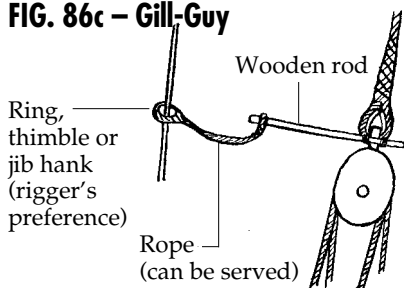
The staysail tack was a simple lead from sail to fife rail and requires no further elaboration. The staysail sheets were single leads, port and starboard, as shown on the plans. Their hauling ends first went through snatch cleats in the bulwarks, then aft to the bulwark cleats.

## 7. Mooring & Other Lines

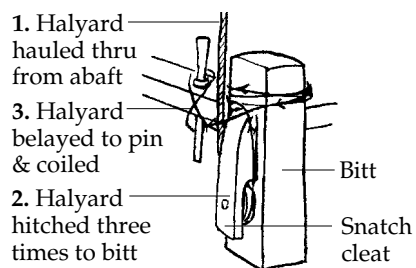
For that "salty" look, add a few coils of line to the deck. Coil them loosely and secure with white glue (see figure 91). Coil the ends of tied-off line around their pins (see figure 92). Add other details. The only limit is your imagination and patience!

Congratulations—your model is complete! Don't hesitate to call Model Expo when you are ready to begin your next modeling endeavor.

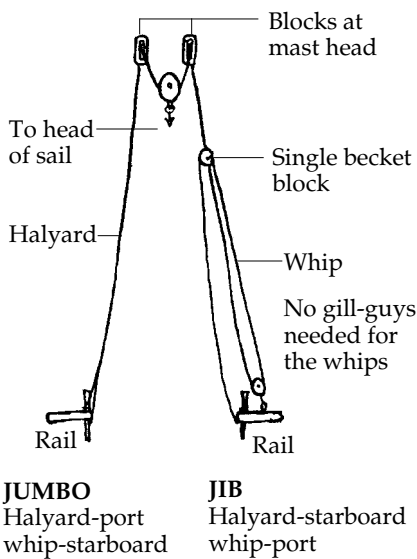
**FIG. 86c – Gill-Guy**



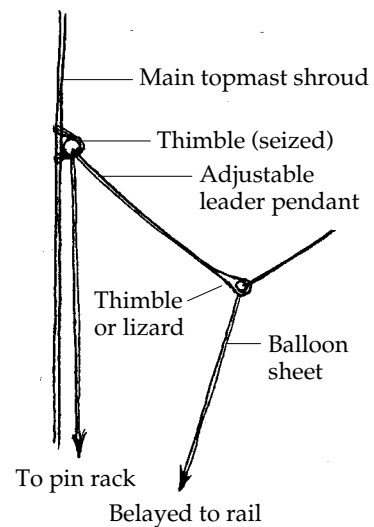
**FIG. 86d – Belaying Halyard at Bitt**



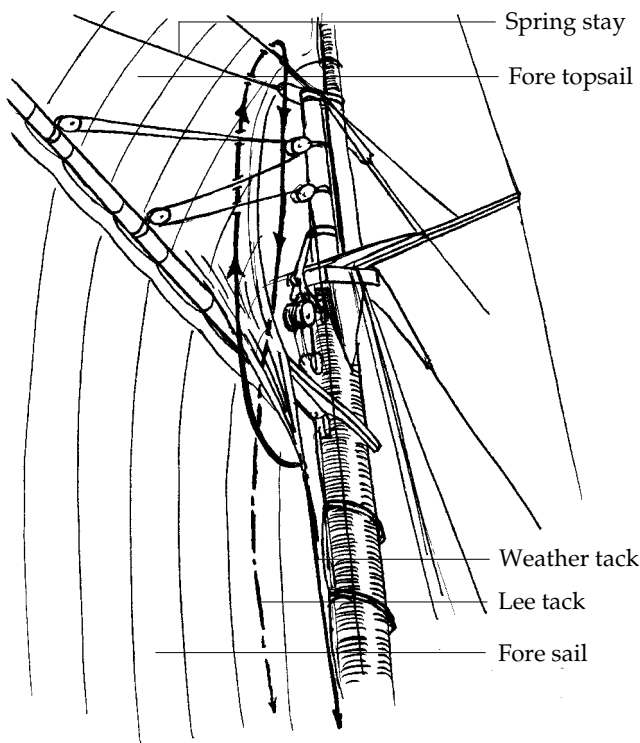
**FIG. 87 – Jumbo & Jib Halyards**



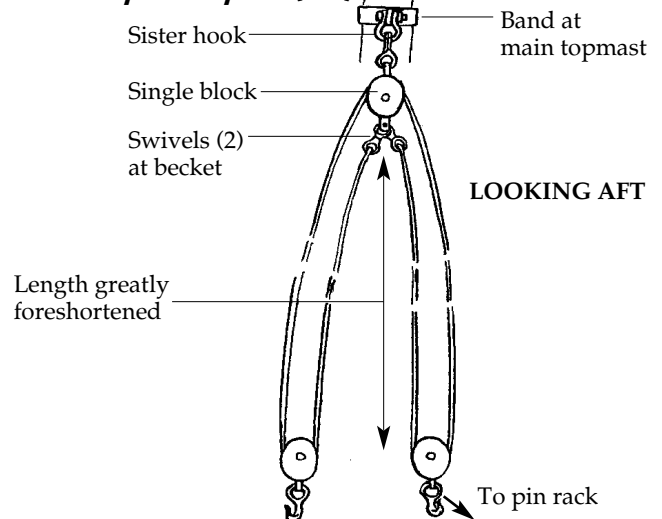
**FIG. 88 – Balloon Sheet Leader**



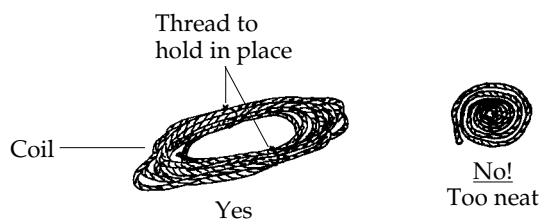
**FIG. 89 – Lead of Fore Topsail Tack (heavy lines)**



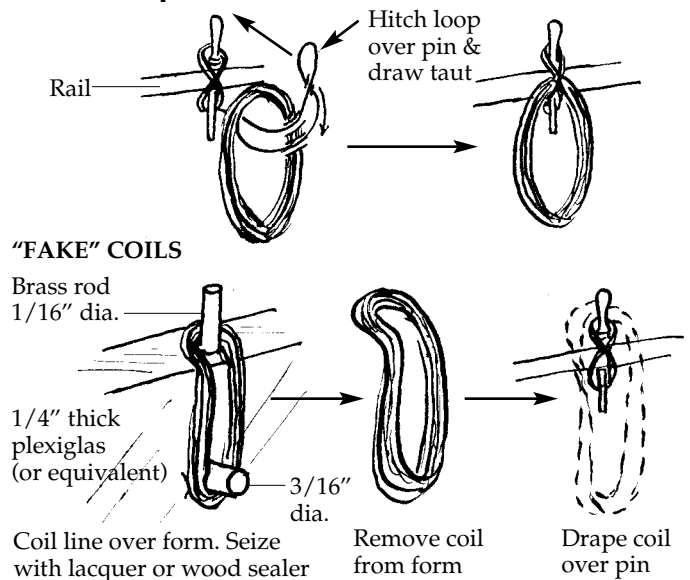
**FIG. 90 – Staysail Halyards (idle)**



**FIG. 91 – Coiling the Ropes**



**FIG. 92 – Rope Coils**



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A comprehensive history of the evolution of the American fishing schooner from about 1825 to its demise as a sailing vessel in the 1930's. This is a monumental study; the gleanings of a lifetime; a book of typical Chapellian expanse with 137 ship plans and supporting sketches. A half of its 690 pages are devoted to his notes and sketches of fishing vessel detail, devices, machinery, rigging, decoration, structure, etc.

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**3. Campbell, G. F.**

*The Neophyte Shipmodeller's Jackstay*  
Model Shipways, 1962. Describes modelwork of a general nature, drawing examples from many types of sailing ships. Contains some good hints on crafts techniques. For the beginner.

**4. Davis, Charles G.**

*The Ship Model Builders Assistant*  
Marine Research Society, Salem, 1926. Sweetman reprint, 1960. Has many useful articles on modeling techniques; unfortunately, some of the text dealing with historical aspects of vessels and their construction is inaccurate. Beware of anachronisms.

**5. Grimwood, Victor R.**

*American Ship Models*  
W.W. Norton, 1942. Bonanza reprint. Contains much useful information on modeling techniques and a very good chapter on tools and materials.

## **Museums with important collections relative to the New England Fishing Industry:**

### **1. Cape Ann Historical Association**

27 Pleasant Street, Gloucester, Massachusetts 01930. Models, paintings, photographs, news clippings, artifact material on exhibit. Comprehensive library on Gloucester maritime history.

### **2. The Mariners Museum**

Newport News, Virginia 23606. Models, paintings, photographs and artifact material on exhibit. Excellent library.

### **3. The Marine Historical Association**

Mystic Seaport, Mystic, Connecticut 06355. Fishing schooner L.A. Dunton; also fishing dories and related exhibits. Excellent library and archival centers

### **4. Peabody & Essex Museum**

161 Essex Street, Salem, Massachusetts 01970. Fine contemporary models of fishing schooners, paintings, artifact material on exhibit; also a splendid collection of builders' half-models and sail plans, mostly in storage and available for study by appointment. Extensive photo files; superb library.

### **5. Smithsonian Institution**

The Museum of American History on Constitution Avenue, Washington, D.C. 20560. Superb collection of rigged models of American fishing craft. Photo files, plans files, artifact material in storage with varying accessibility.

### **6. South Street Seaport Museum**

16 Fulton Street, New York, New York 10038. Fishing schooner and fishing gear.

### **7. Whaling Museum**

18 Johnny Cake Hill, New Bedford, Massachusetts 02740. An important collection of photographs of fishing taken by Albert Cook Church is available for study by arrangement with the museum staff.

## MODELER'S LOG

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## MODEL SHIPWAYS

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